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SCEA

SCSI Cluster Expansion Adapter
User's Manual

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Return and Repair Policy

WARRANTY PERIOD

The following warranty period is from the date of shipment:

CMD Host Adapter	one year
Cable	90 days
Drive	manufacturer's warranty

RETURN FOR CREDIT

The allowable period of return for credit from the date of shipment is as follows

CMD Host Adapter	less than 30 days
Cable	less than 30 days
Drive	not applicable

RETURN FOR REPAIR

CMD Host Adapter

In-Warranty (Less than 1 year)

- CMD offers a *15 working day turnaround repair service* at the cost of parts only. Defective boards will be repaired and returned to the customer within 15 working days from the date of return to CMD.
- CMD also offers two *in-warranty 24 hour expediting services:*

  24 Hour Turnaround Loaner Service:

  Under this policy, CMD will ship a loaner in 24 hours during regular working days to the customer for a charge of $100.00 per loaner. Upon receiving the loaner, customer must return the defective board to CMD within seven (7) days for repair. CMD will repair the defective board and return the board to the customer. Customer must then return the loaner in seven (7) days after the receipt of the repaired board. Approval for loaner service is based on credit verification.

  24 Hour Turnaround Swap Service:

  In the case that the defective board is within the first six (6) months of the warranty, CMD, at its own option, offers a 24 hour turnaround swap service. CMD will ship the same model of the board to customer within 24 hours during working days in exchange for the defective board. CMD will swap with a new board if board is not functional upon arrival. For all other cases, swap will occur with either a new or refurbished board for a charge of $200.00. CMD does not offer swap services for boards that are purchased more than six months from the date of shipment. Customer is responsible for returning the defective board to CMD within seven (7) days after receipt of the swapped board.
- The remaining warranty period shall apply to the repaired or swapped board.

Out-of-Warranty (more than 1 year)

- CMD offers a *15 working day turnaround repair service* at a rate of $300.00 plus parts and freight for all out-of-warranty host adapter boards. Defective boards will be repaired and returned to customer within 15 working days starting with date of return to CMD.
- CMD also offers an *Out-of-Warranty 24 Hour Turnaround Loaner Service:*

  Under this policy, CMD will ship the same model loaner in the 24 hour time frame of working days to customer for an additional charge of $100.00 plus freight per loaner. The loaner is for use by the customer during the period that the defective board is being repaired. Customer is responsible for returning the defective board to CMD within seven days after the receipt of loaner and returning the loaner in seven (7) days once the defective board is repaired and received. The approval of the loaner service is at CMD's option and based upon customer credit verification.
- CMD will extend warranty for a period of six (6) months on any out of- warranty repaired board.

Cable

In-Warranty (90 days) - free swap.

Out-of-Warranty (90 days) - not applicable.

Drive

In-Warranty (per manufacturer) - manufacturer charge only.

Out-of-Warranty (per manufacturer) - manufacturer charge plus $100 CMD handling.

RETURN FOR UPGRADE/ UPDATE

CMD Host Adapter

In-Warranty (less than 1 year)

- CMD offers a *15 working day turnaround different function upgrade service* for boards that can be upgraded to a higher function; and a *free 15 working day turnaround ECO Field Upgrade* for all its boards. CMD will *upgrade* the hardware of its board to a higher function for a charge of the difference of list prices of the original and upgraded functions. CMD will also update its board to its latest firmware release at no charge to the customer. Boards will be upgraded/updated and returned to the customer within 15 working days from the date of return to CMD.
- CMD also offers *24 hour turnaround loaner service* as stated in "RETURN FOR REPAIR."
- The remaining warranty period shall apply to the updated board. For upgraded boards, CMD will extend warranty for a period of six months.

Out-of-Warranty (More than 1 year)

- CMD offers a *15 working day turnaround different function upgrade service* for boards that can be upgraded to a higher function at a charge of the difference of list prices of two functions. CMD also offers a *free 15 working day turnaround ECO Field Upgrade* for all its boards. Boards will be upgraded/updated and returned to customer within 15 working days from the date of return to CMD.
- CMD also offers *24 hours turnaround Loaner Service* as stated in "RETURN FOR REPAIR."
- There will be no warranty extension for same function firmware update. For different function Hardware upgrade, CMD will extend warranty for a period of six (6) months.

Drive—same as in RETURN FOR REPAIR.

SHIPPING CHARGES

The following shipping charges apply to all REPAIR, SWAP, LOANER, and UPGRADE UNITS.

In-Warranty

- Domestic - freight from CMD to customer is to be paid by CMD; freight from customer to CMD is to be paid by customer.
- International - all fees are to be paid by customer (including custom duty and broker fees).

Out-of Warranty

- Domestic - all fees are to be paid by customer.
- International - all fees are to be paid by customer (including custom duty and broker fees).

GENERAL CONDITIONS

All goods returned to CMD including returns for credit, swap returns, loaner returns, and evaluation returns shall remain in good condition. Any damage or alteration done by the customer will result in a rejection or additional charge to the customer.

Customer must consult CMD Technical Support for authorization of CMD not functional upon arrival boards and swap requests. CMD Sales personnel must be consulted for authorization of returned goods for credit and/or evaluation.

Preface

The SCEA Revision 1.4 is the fourth revision of the SCEA User's Manual. The following changes have been made to the SCEA User's Manual:

- Configuration information for DEC Alpha AXP systems has been added.
- The section on Multi-Hosting Configuration for VMS has been changed.
- An additional illustration in Chapter 4 shows a pin out diagram for the SCEA RS-232 port.
- The discussion of the SCEA On-Board Utility has been updated.
- Table C-3 has been updated to reflect a change in the position of the W11-2 jumper.

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1

Introduction

This User's Guide explains the basics of your SCEA™. It includes information on setting up and configuring the system for use.

How to Use this Manual

This guide has four chapters, three appendices, a glossary, and an index. Each chapter explains a different aspect of preparing your SCEA for use. You may refer to the appendices for further configuration and troubleshooting information. The following descriptions summarize each section.

Chapter 1: Introduction explains the purpose of this guide and details the conventions used.

Chapter 2: Features and Components describes the SCEA and details its distinct features and specifications.

Chapter 3: Installation describes installation procedures for the SCEA, SCSI devices, and termination of the SCSI bus.

Chapter 4: Configuration describes configuration of operating system software for use with the SCEA, the On-Board Utility, and Multi-Hosting with VMS.

Appendix A: Supported Devices and Operating Systems lists the SCSI devices and operating systems compatible with the SCEA.

Appendix B: Troubleshooting gives some troubleshooting guidelines for the SCEA.

Appendix C: Connectors and Jumper Settings lists all connectors and jumper settings for the SCEA.

Conventions

The following conventions are used in the SCEA User's Guide.

Keycaps—Characters in square brackets represent keys on your keyboard. For example, "Press **[ENTER]**" means press the **[ENTER]** key. When two or more keys are joined by a plus sign (+), press those keys at the same time.

Commands—Italics text represents a command that can be used on a system, such as *show dev dk* on the VAXstation 3100™.

NOTE Sometimes italics will be used for emphasis where no action is necessary; for example, "*do not* remove jumper shunt W13."

Entering Text or Commands on Screen—Text or commands that must be entered on screen will be in italics and bold as ***show dev dk***; be sure to enter the text or command and press **[ENTER]**.

2

Features and Components

This chapter describes the SCEA in detail. SCEA features, components, and specifications are described in each section.

Features

The SCEA is a SCSI to SCSI workstation adapter which allows you to connect hard disk drives, erasable optical drives (without any software patches or special drivers), and tape drives to a workstation such as the VAXstation™ 3100, DECstation™ 5000/200, Sun SPARCstation™, IBM RISC System/6000™ series, or Silicon Graphics IRIS INDIGO systems.

For purposes of this manual, the port connecting to the host computer (J1 on the SCEA) is called the Host SCSI Port; the port connecting to the target devices (J2) is called the Device SCSI Port. These target devices may include disk, tape, optical drives, jukeboxes, and tape stackers.

The host computer plays the role of initiator to the SCEA and SCSI devices, and the SCEA plays the role of target to the host computer at J1. The SCEA, in turn, plays the role of initiator to SCSI devices from J2, the Device SCSI Port.

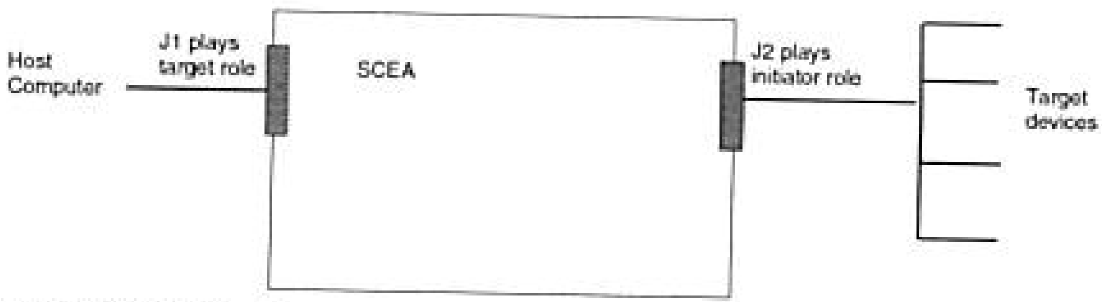


Figure 2-1: SCEA SCSI ports

Removable Media

When enabled, a removable drive is reported as removable. For the VAXstation 3100, the VMS dismount drive will eject the media if the drive is removable. Place jumper shunt in W12-6 to enable this feature as shown in Table 2-1.

NOTE ***Do not use this feature with SCEA/J1 or SCEA/J2 for jukeboxes.*** When selected, the media will eject from the drive and you will not be able to access it inside the jukebox.

Table 2-1 **Removable Media**

W12-6	IN	Removable Media enabled
W12-6	OUT	Removable Media disabled (F)

Note that (F) is factory setting.

Platform Control

Platform control is available for the SCEA/J1 and SCEA/J2 and tells the SCEA what type of platform is being used. Default is W14 all OUT for DEC VAX. If you are using any other platform than DEC VAX, simply install jumper shunts into W14 location as shown in Table 2-2.

Table 2-2 **Platform Control**

Platform	W14-1	W14-2	W14-3	W14-4	W14-5 (close to J5)
DEC VAX (F)	OUT	OUT	OUT	OUT	OUT
IBM	OUT	OUT	OUT	OUT	IN
SUN	OUT	OUT	OUT	IN	OUT
PC	OUT	OUT	IN	OUT	OUT
DEC ULTRIX	OUT	IN	OUT	OUT	OUT
SGI	IN	OUT	OUT	OUT	OUT
UNISYS	OUT	OUT	IN	IN	OUT

Note that (F) is factory setting.

Multi-Hosting for VMS

CMD's multi-host solution can support disk, tape, and optical devices including jukeboxes for VMS *only*. It gives you the ability to completely share an array of disks and tapes between multiple VAX systems running VAX cluster software. Multi-hosting configuration instructions are given in Chapter 4. Refer to Appendix A for supported disk and tape devices.

SCSI Library Manager

The SCSI Library Manager (SLM or SLM/Unix) is an optional application software license that works exclusively with the SCEA for VAX/VMS and Unix systems.

SCSI Library Manager was designed to work with multiple jukeboxes as well as a single jukebox with from one to five erasable optical or WORM drives installed. With just a few keystrokes, SLM controls all basic operations like inserting, removing, and flipping erasable or WORM cartridges from the drive unit.

In addition to giving you complete control of jukebox functions, SLM also has a build-in callable user interface allowing you to customize SLM to your requirements. This is especially useful for applications to support file management. Refer to SLM or SLM/Unix Management Guides for installation and operation.

SCEA Models

The SCEA is sold in three basic versions: SCEA/E, SCEA/C and SCEA/J. Although the basic SCEA is identical for each version, the function of the SCEA board is determined by the firmware installed by CMD during its final test. It is important that you understand the functions provided by each SCEA version as listed in this section. SCEA models and CMD model numbers are as listed in Table 2-3.

Table 2-3 SCEA Models

SCEA Model	CMD Model #	Devices Supported
SCEA/E	CSB-2000/E	Supports 2 drives (LUN 0 and 1)
SCEA/C	CSB-2000/C	Supports 7 drives (LUN 0, 1, 2, 3, 4, 5, and 6)
SCEA/J1	CSB-2000/J1	Supports a jukebox of one drive up to 32 slots (LUN 0, 1, 2, 3, 4, 5, and 6)
SCEA/J2	CSB-2000/J2	Supports a jukebox of more than one drive and more than 32 slots (LUN 0, 1, 2, 3, 4, 5, and 6)

The SCEA/E firmware is designed to provide a transparent hardware interface solution for erasable optical (MO) disks, 4-mm and 8-mm helical scan tape drives, nonsystem-supported SCSI Winchester disk drives and other special SCSI peripheral devices without requiring patches or drivers to the host workstation operating system. SCEA/E does this by causing the SCSI peripheral to emulate a generic Winchester system disk or tape drive. The SCEA board and firmware recognizes the attached peripheral, then selects the most appropriate device emulation type. SCEA/E supports up to two SCSI peripherals.

The SCEA/C firmware provides expansion capabilities for your workstation's SCSI port. The SCEA/C provides SCSI LUN (Logical Unit Number) support for up to seven SCSI devices for each SCSI ID used. One SCEA/C is required for each SCSI ID to be expanded. Multiple SCEA/Cs can be used to support up to a total of 49 SCSI devices per SCSI port. The SCEA/C also provides multi-hosting and peripheral sharing capabilities for DEC VMS-based VAXstations. The SCEA/C also provides a "SCSI Pass-Through" mode for those applications where driverless operation is not desired or required; both "pass-through" and SCEA/E hardware driver supported devices can be used on the same SCEA/C board (no additional SCEA board is required).

The SCEA/J firmware combines the capabilities of the SCEA/E and SCEA/C to provide a seamless integration solution for interfacing optical disk jukeboxes, 4-mm and 8-mm tape cartridge handling systems, and most SCSI-based robotic devices when used in conjunction with CMD's SCSI Library Manager (SLM) software package.

Two versions of the SCEA/J firmware are available to support low-end (SCEA/Jl) and high-end (SCEA/J2) jukeboxes. SCEA/J1 supports one drive and 32 media slots or less and CMD's SLM J1 or SLM/Unix J1 software license. SCEA/J2 supports up to six drives and 128 slots and CMD's SLM J2 or SLM/Unix J2 software license. The SCEA/Jl version will not accept commands from an SLM/Unix J2 software license, and vice versa. For more detail, refer to the SLM/Unix Management Guide.

Components

This section details the SCEA components. Figure 2-2 illustrates the SCEA.

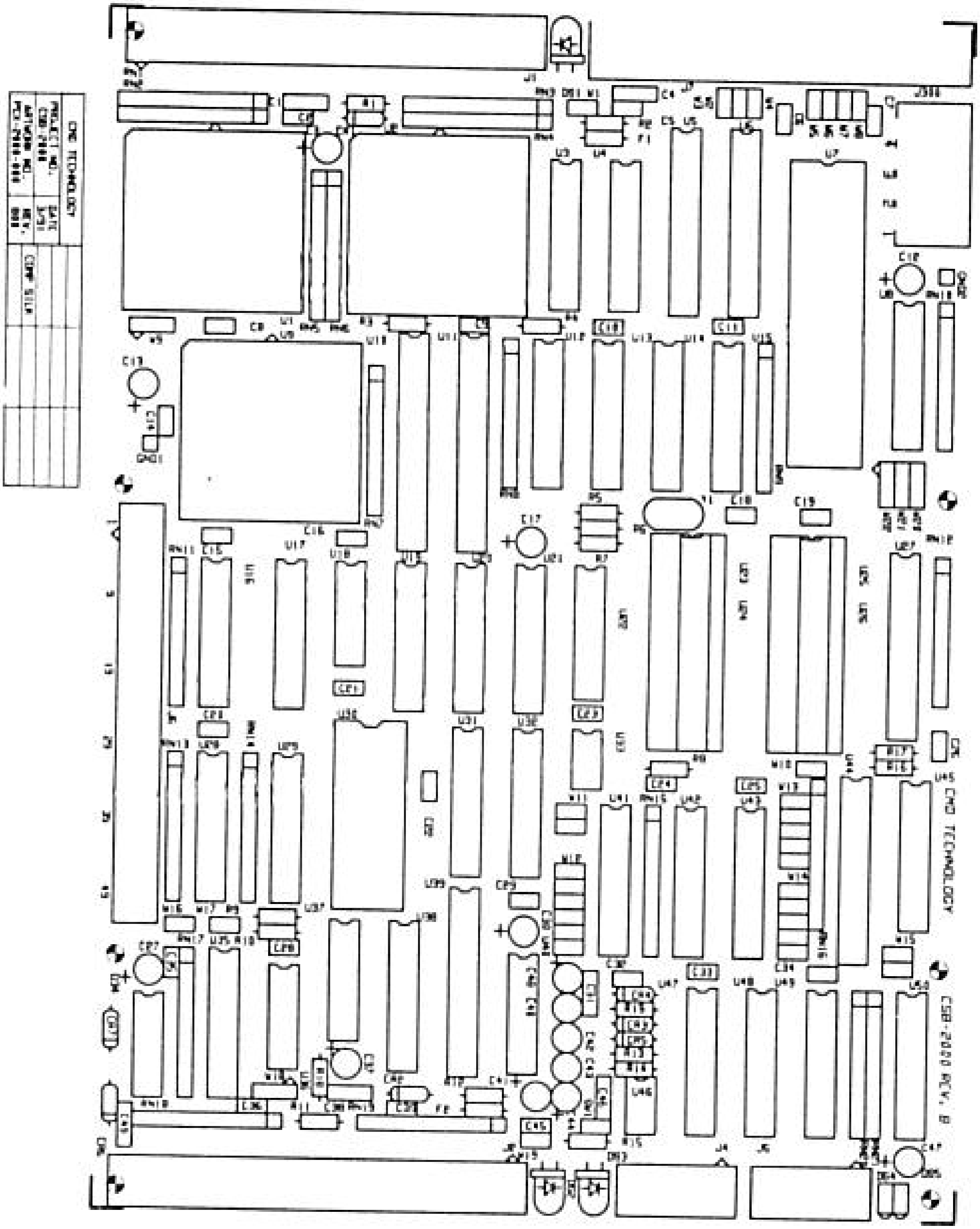


Figure 2-2: SCEA components

LED Indicators

LED indicators light up when the SCEA is installed and powered ON. The green lights indicate normal functions of the SCEA; the red light indicates a possible problem.

LED DS1 is located next to J1; LEDs DS2 and DS3 are next to J2; and LEDs DS4 and DS5 are next to J5. Table 2-4 lists the LED indicators for the SCEA.

Table 2-4 LED Indicators

DS1	Green LED. This LED is ON if J1 connector TERMPWR is active on the SCSI bus. This includes TERMPWR supplied by the SCEA or other device(s) on the SCSI bus.
DS2	Green LED. This LED is ON if J2 connector TERMPWR is active on the SCSI bus. This includes TERMPWR supplied by the SCEA or other device(s) on the SCSI bus.
DS3	Green LED. This LED is ON if J2 is selected for single-ended mode. This should normally be ON.
DS4	Green LED. This LED blinks during SCSI activity.
DS5	Red LED. This LED is ON if an error condition occurs.

Specifications

Table 2-5 lists the controller specifications for the SCEA.

Table 2-5 Controller Specifications

Bus Interface	SCSI
Software Supported	DEC VMS, DEC ULTRIX, IBM AIX, SunOS, SCO Unix, SGI IRIX, MS-DOS 3.3 and above on 286/386 PC and Novell Netware on 386 PC.
Multiple-Hosting	Support multi-hosting for disks, optical drives, and tapes for VMS *only*.
Formatting	On board format (ISO standard for optical erasable disk format)
Optional Software	SCSI Library Manager (SLM and SLM/Unix)
LED Indicators	Self test, error conditions
Peripheral Interface	Small Computer System Interface (SCSI-2)
SCSI Transfer Rate:	up to 5.0 MB/sec in Synchronous Mode up to 3.0 MB/sec in Asynchronous mode
SCSI Bus Parity	Odd parity
System Performance	Support disconnect/reconnect capability and multi-host configuration
SCSI Driver/Receiver	Single-ended
SCSI Cable Length	Single-ended, up to 20-feet (6-meters)
Operating Temperature	5° C to 50° C
Relative Humidity	10% to 90% , Noncondensing
Power Requirement	5V DC, 2.3 A (max)

SCSI Bus Cabling

The SCEA contains two 50-pin SCSI ports. One of the ports is connected to the host computer, the other to the target devices. When the SCEA and the SCSI devices are installed in the same cabinet which meets EMI/RFI shielding requirements, a 25-signal twisted-pair cable must be used for connecting the SCEA (J2) and the SCSI devices. When the SCEA and the SCSI devices are installed in separate cabinets, a shielded SCSI cable should be used to meet FCC requirements.

A minimum conductor size of 28 AWG shall be used to minimize noise effects and ensure proper distribution of optional terminator power. The maximum cable length is 6.0 meters or 20 feet in single-ended mode.

Host SCSI Port

The Host SCSI Port, J1, on the SCEA is a 50-pin single-ended SCSI connector which connects to the SCSI port of the host computer (workstation). To the host computer, the SCEA looks very much like an ordinary target device.

Each device (initiator or target) on the SCSI bus requires a unique SCSI Identification address (specifically SCSI ID 0-7). SCSI ID 7 has the highest priority on the bus and SCSI ID 0 has the lowest priority. The SCEA is factory configured to SCSI ID 0 at J1. You can change this ID by selecting a SCSI ID for the SCEA that is not currently being used on the system (to check SCSI ID number perform *show dev dk*, for example, on VAXstation 3100). See Chapter 3 for SCSI ID selections from on-board jumpers.

For example, if the target device is to be seen as SCSI ID 2 by the host, set the SCEA to SCSI ID 2 (by configuring the SCEA described in Chapter 3) and the target device to SCSI ID 0. The SCEA and target device will be seen by the host as one device, SCSI ID 2 or DKA200 on the VAXstation 3100 (using *show dev dk*).

Host SCSI Port Termination

Terminator resistors, RN1, RN3, and RN4, are removable 220/330-ohm terminator resistor packs for the J1 Host SCSI Port. SCSI bus specifications require the cable to be terminated at both *physical* ends. Termination is usually required at J1 on the SCEA except in the VAXstation 3100 and DECstation™ 5100. See Chapter 3 for proper installation instructions.

The SCEA can supply power to the TERMPWR (pin 26) of the SCSI connector J1 through a diode, a fuse (F1), and a jumper (W1). Since the SCEA plays the target role, it should not have to supply TERMPWR, therefore, W1 should be out. However, if the host computer does not supply termination power, place jumper shunt on W1 (see Chapter 3 for installation instructions).

Device SCSI Port

The Device SCSI Port, J2, on the SCEA is a 50-pin single-ended SCSI connector which connects to the target devices. The SCEA is factory configured to SCSI ID 7 at J2. See Chapter 3 for Device SCSI Port ID settings from on-board jumpers.

Since the SCEA is factory configured to SCSI ID 7 (at J2), the SCSI ID of the target devices connected to the SCEA should be set from SCSI ID 0 to 6 starting at SCSI ID 0. For the VAXstation 3100, only one drive is initially supported, and the drive SCSI ID must be 0; others may be manually set using the Sysgen Connect Statement. For the Sun SPARCstations and SPARCservers, the SCSI ID should start at 0. Up to 7 drives are supported.

Device SCSI Port Termination

Terminator resistors, RN17, RN18, and RN19, are removable 220/330-ohm terminator resistor packs for the J2, Device SCSI Port. The SCSI bus specifications requires the cable to be terminated at both *physical* ends of the SCSI bus. It is recommended that these resistors remain in place if this connector is at one *physical* end of the cable.

The SCEA supplies terminator power to the TERMPWR pin (pin 26) of SCSI connector (J2) through a fuse (F2), a diode, and jumper block W19. To install terminator power, install W19. W19 should remain installed since the J2 SCSI port acts like an initiator to the target devices on the bus.

Any SCSI terminator (on-drive or external) needs to be powered by at least one SCSI device, otherwise the SCSI signals will be pulled down. Typically, an initiator (SCSI host adapter) provides the power to the on-board terminator, the external SCSI terminator, or the on-drive terminator when the drive is powered OFF.

Anytime an external SCSI terminator (instead of an on-drive SCSI terminator) is used, the SCSI terminator power option of the SCEA has to be enabled at jumper shunt W19.

3

Installation

Installation of the SCEA may vary with each application. The SCEA may be installed inside the chassis of the SCSI device if space constraints allow, inside a storage box like the DEC BA42 Storage Expansion Box, inside a jukebox like the IDE 9000 or inside a dedicated peripheral enclosure. This section details installing the SCEA and its respective SCSI devices.

Installing the SCEA into a Storage Box, Shoebox, or System

To install the SCEA follow these instructions carefully.

1. Turn the host computer completely OFF and unplug the power cord from the wall.
2. Carefully unpack the SCEA and place on a non-metallic surface.

WARNING **Be sure to wear anti-static wrist straps or equivalent to protect the SCEA from electro-static damage.**

3 Carefully install the SCEA into an assigned slot inside a storage box, shoebox, or system, see Figure 3-1 for an example.

WARNING **❶ Make sure the SCEA or any of its components are NOT directly connected to or touching metal surfaces; attach plastic washers on BOTH sides of the mounting screws.**

❷ Make sure there is proper ventilation in the storage unit.

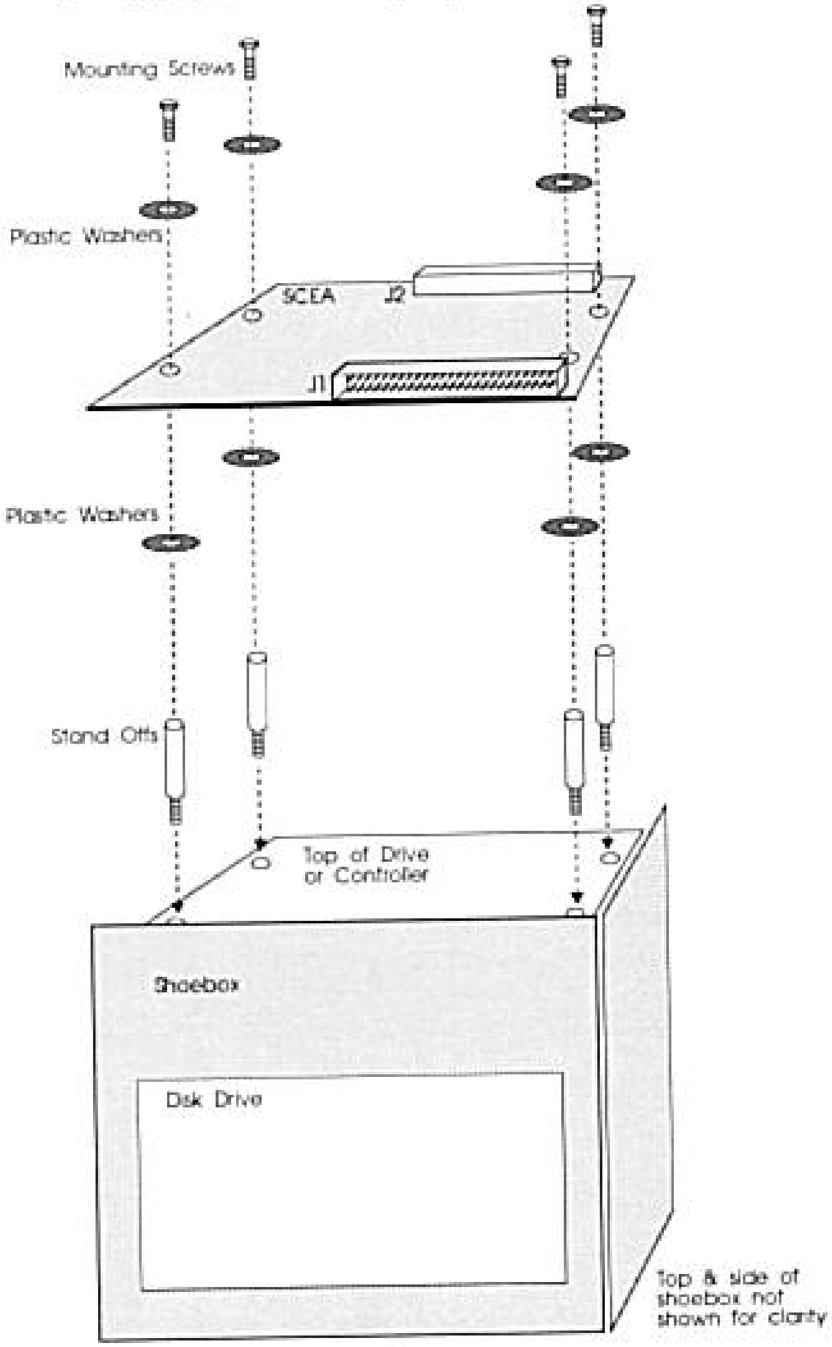


Figure 3-1: Shoebox installation example

4 Set Host SCSI Port ID (J1) to *0* by making sure jumper(s) are removed from W12 pins. If another device on the SCSI bus has SCSI ID 0, set the J1 SCSI ID to 1, 2, 3, or another number up to 7 by placing jumpers over the pins as listed in Table 3-1 (see Chapter 2, section "Host SCSI Port" for explanation of SCSI ID).

Table 3-1 Host SCSI Port ID (J1) Jumper Selections

Host SCSI Port ID	W12-1	W12-2	W12-3
SCSI ID = 7 (DO NOT USE—reserved for Host Computer)	IN	IN	IN
SCSI ID = 6	IN	IN	OUT
SCSI ID = 5	IN	OUT	IN
SCSI ID = 4	IN	OUT	OUT
SCSI ID = 3	OUT	IN	IN
SCSI ID = 2	OUT	IN	OUT
SCSI ID = 1	OUT	OUT	IN
SCSI ID = 0 (factory)	OUT	OUT	OUT

Figure 3-2 illustrates an example of SCSI configuration for a system.

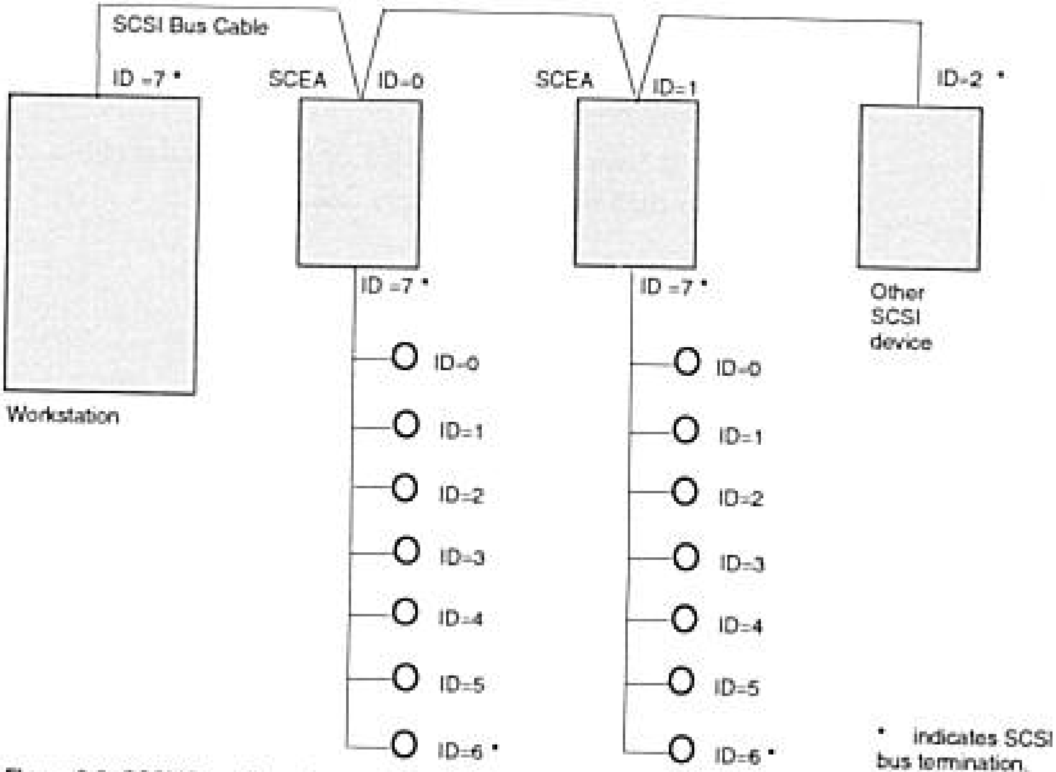


Figure 3-2: SCSI ID configuration

5 Connect one end of the SCSI cable from the SCSI connector of the host computer to the SCEA at J1, Host SCSI port; see Figure 3-3.

WARNING **To prevent damage to the SCEA, pin 1 of the SCSI cable and pin 1 of the SCEA *must* align.**

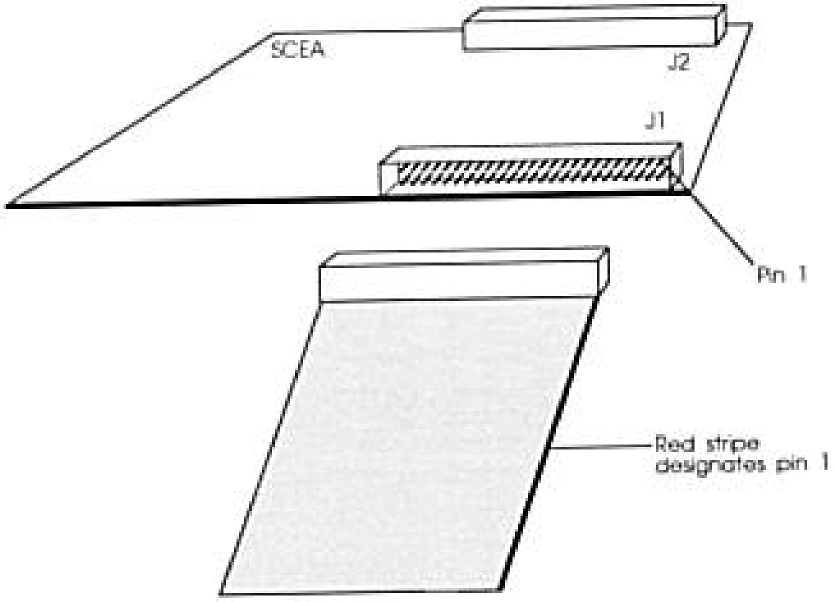


Figure 3-3: Host SCSI port (J1) cable connection

If the SCEA is inside a storage box or shoebox, the cable connection will be similar to that shown in Figure 3-4.

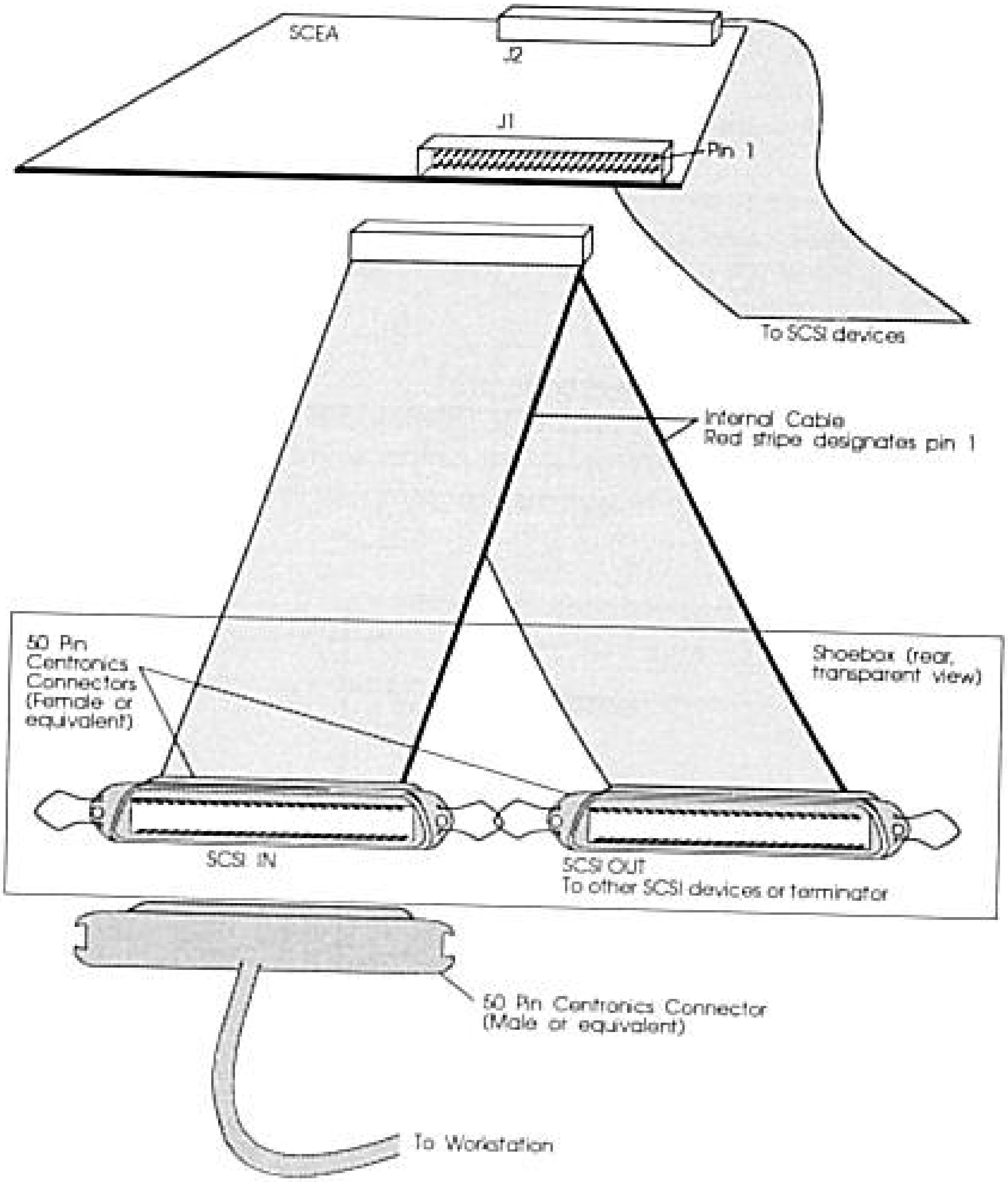


Figure 3-4: Shoebox or Storage Box J1 SCSI connection

6 Terminate each *physical* end of the SCSI bus connected to J1. If SCEA is not at one end of the SCSI bus, *remove terminators* at J1. For VAXstation 3100 and DECstation 5100 systems, *always remove terminators* at J1. Follow the instructions below (see Figure 3-5):

To remove terminators at J1:
Remove the three (3) terminators in locations RN1, RN3 and RN4 from the SCEA located near J1. Remove jumper shunt in W1 to disable TERMPWR at J1.

To install terminators at J1:
Put three (3) terminators in locations RN1, RN3 and RN4 near J1 (numbers must face J1). Put jumper shunt in W1 to supply TERMPWR (check first to be sure the host computer is not supplying terminator power).

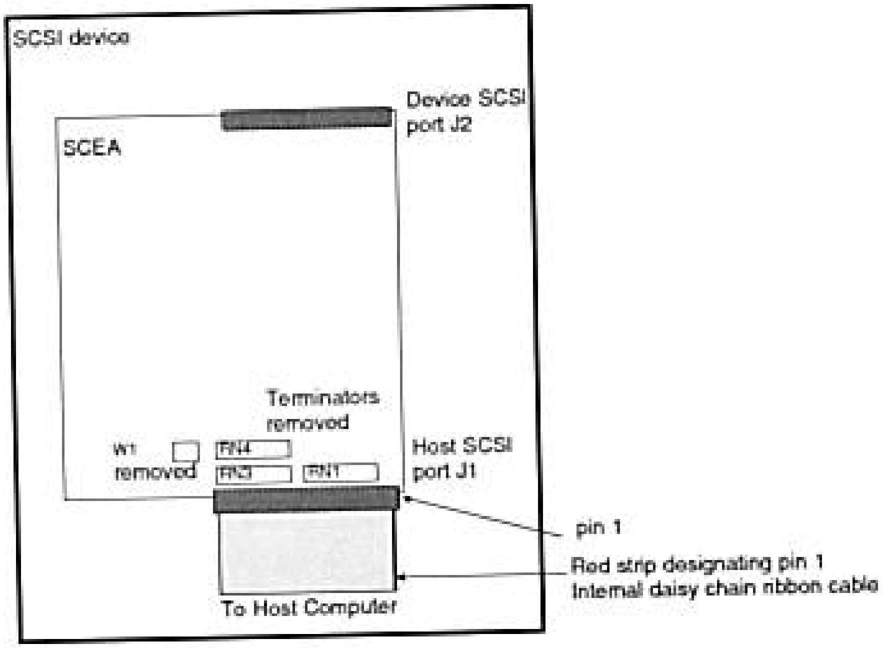


Figure 3-5: Host SCSI port termination

7 Connect the appropriate 4-pin power cable to the power connector, J300. Be sure pin 1 from the cable is aligned with pin 1 on the SCEA as shown in Figure 3-6. For connector information, see Appendix D.

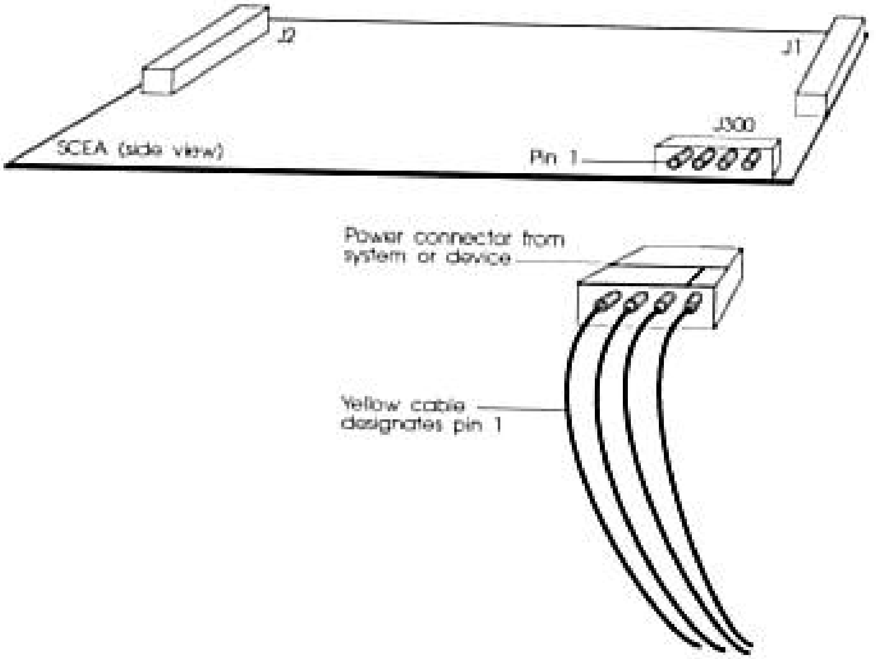

J2
J1
J300
SCEA (side view)
Pin 1
Power connector from system or device
Yellow cable designates pin 1

Figure 3-6: Power connection

8 Make sure jumpers are on W13-1, W13-2, and W13-3 to identify the Device SCSI port (J2) as ID 7. If another device on the SCSI bus has SCSI ID 7, set the J2 SCSI ID to 6, 5, 4, or another number down to 0 by placing jumpers over the pins as listed in Table 3-2 (see Chapter 2, section "Device SCSI Port" for complete explanation of SCSI ID; see Figure 3-1 also for details).

Table 3-2 Device SCSI Port ID (J2) Jumper Selections

Device SCSI Port ID	W13-1	W13-2	W13-3
SCSI ID = 7 (factory)	IN	IN	IN
SCSI ID = 6	IN	IN	OUT
SCSI ID = 5	IN	OUT	IN
SCSI ID = 4	IN	OUT	OUT
SCSI ID = 3	OUT	IN	IN
SCSI ID = 2	OUT	IN	OUT
SCSI ID = 1	OUT	OUT	IN
SCSI ID = 0	OUT	OUT	OUT

9 Connect one end of a SCSI cable to the SCEA at J2, Device SCSI port; pin 1 of the cable and pin 1 of J2 *must* align to prevent damage to the system (see Figure 3-7).

WARNING To prevent damage to the SCEA, pin 1 of the SCSI cable and pin 1 of the SCEA *must* align.

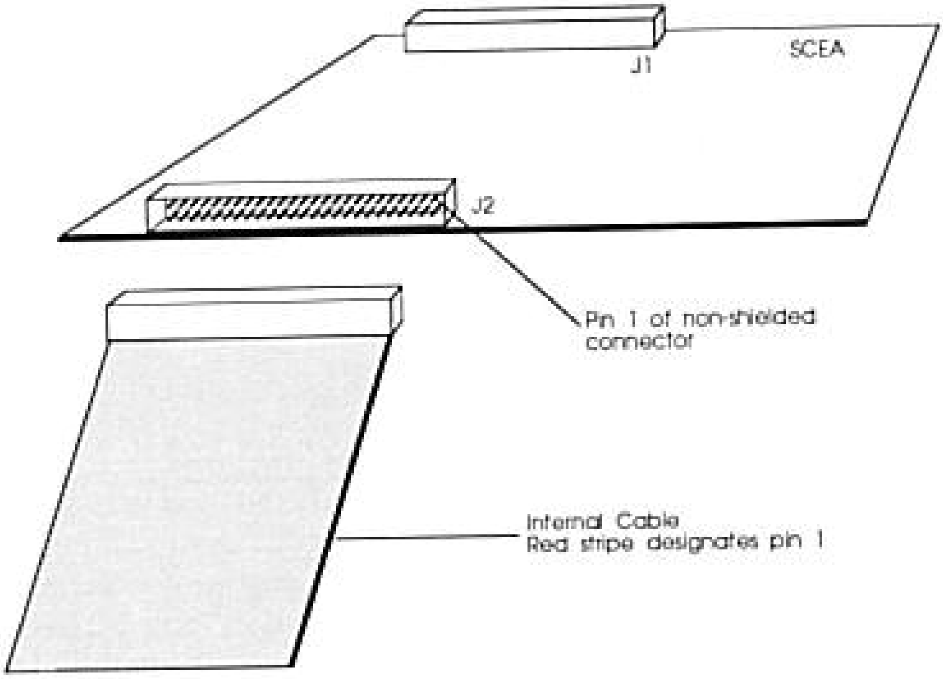


Figure 3-7: Device SCSI port (J2) cable connection

10 Connect the other end of the cable to the SCSI device (align pin 1's). Up to seven devices may be installed by correctly cabling to other SCSI devices.

Figure 3-8 shows the SCEA/C inside the subsystem rackmount chassis with devices connected and SCEA/E inside the optical drive.

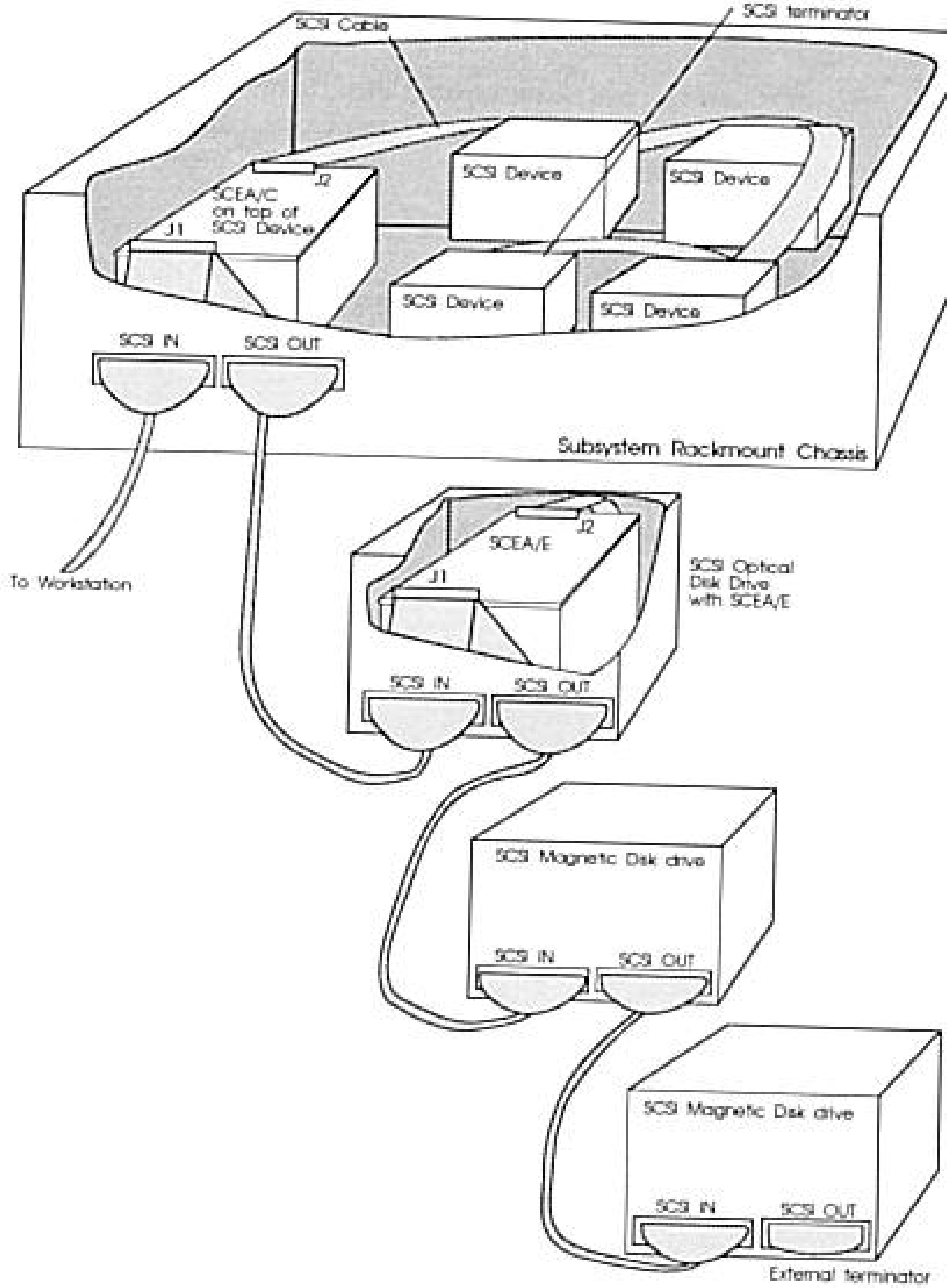


Figure 3-8: Cabling example from inside Subsystem

11 Terminate each *physical* end of the SCSI bus connected at J2. *DO NOT* terminate devices in the middle of the SCSI bus; if the SCEA is in the middle of the SCSI bus; *remove terminators at J2.*

SCSI devices can be terminated directly on the device (see manufacturer's documentation) or by using an external terminator as shown in Figures 3-8.

To install terminators at J2:
Put three (3) terminators in locations RN17, RN18, and RN19 (numbers must face J1); put jumper shunt in W19 (this allows for +5-volts to be sent to the external terminator at the end of the SCSI bus).

To remove terminators at J2:
Remove the three (3) terminators in locations RN17, RN18, and RN19, next to J2 on the SCEA. W19, TERMPWR, may be removed if another device is supplying terminator power. See Figure 3-9.

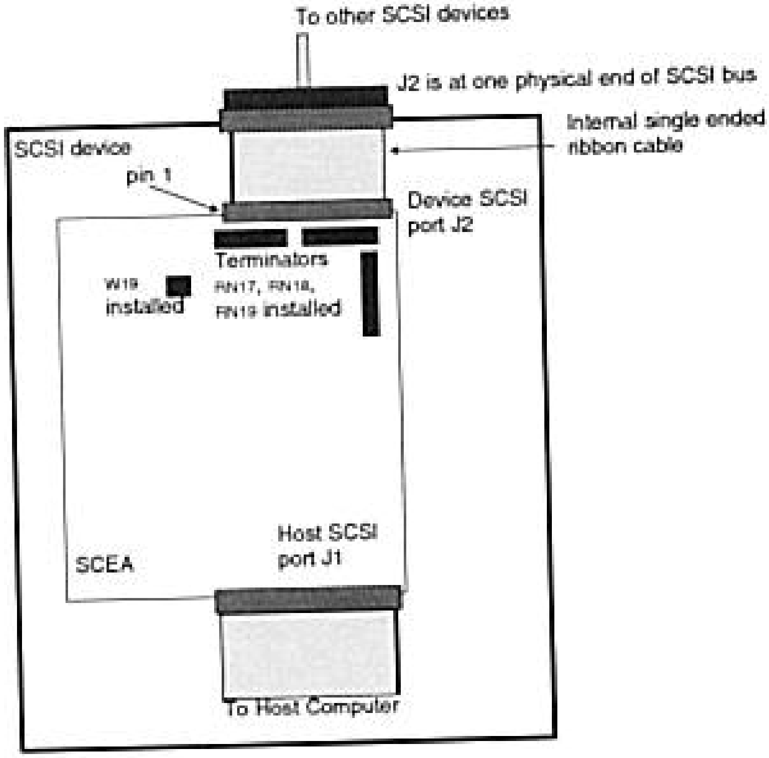

To other SCSI devices
J2 is at one physical end of SCSI bus
Internal single ended ribbon cable
SCSI device
pin 1
Device SCSI port J2
Terminators RN17, RN18, RN19 installed
W19 installed
Host SCSI port J1
SCEA
To Host Computer

Figure 3-9: Device SCSI port termination

12 If you *do not* want the SCEA to supply terminator power (TERMPWR), remove jumper shunt at W19.

Installing the SCEA into a TRIMM SCEAbox Enclosure

To mount the SCEA into the SCEAbox, follow these instuctions:

1 Put the SCEAbox on a flat surface.

2 Open the box carefully by following the instructions accompanying the SCEAbox. (Remove the screw in the top center of the back of the box and the two screws on the front bottom of the box. While facing the front of the SCEAbox, slide the top of the box chassis toward you and remove it from rest of the SCEAbox.)

3 Align the SCEA in the SCEAbox with J1 facing the back of the box (SCSI connectors are at the back of the box). *DO NOT* mount it to the standoffs in the SCEAbox at this time.

4 Connect the 4-pin power cable to the power connector, J300. Make sure pin 1 from the cable is aligned with pin 1 on the SCEA (see Figure 3-6 for reference). For connector information, see Appendix D.

5 Connect the long internal SCSI cable from the SCSI connector in the SCEAbox to the J1, Host SCSI port, on the SCEA. (Route the SCSI bus cable under the SCEA board carefully before plugging into the connector.) See Figure 3-10.

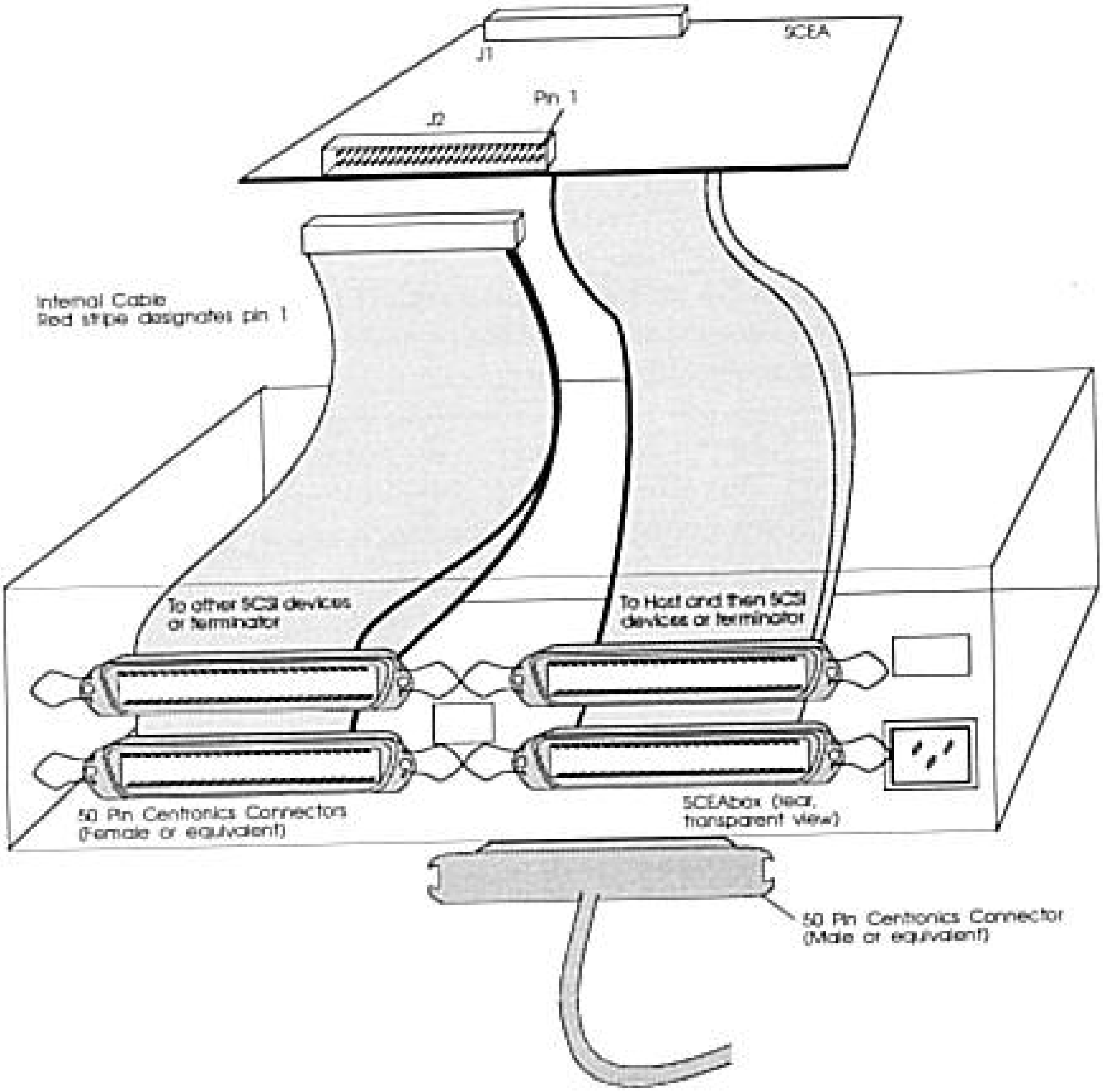


Figure 3-10: Connecting SCSI cables in the SCEAbox

6 Connect the short internal SCSI cable from the SCSI connector of the SCEAbox to the J2, Device SCSI port, on the SCEA.

7 With the SCEA over the four white mounting standoffs on the bottom of the SCEAbox, push the SCEA down firmly so that the standoffs are secure in the four holes in the edges of the SCEA. This affixes the SCEA's location in the box. See Figure 3-11.

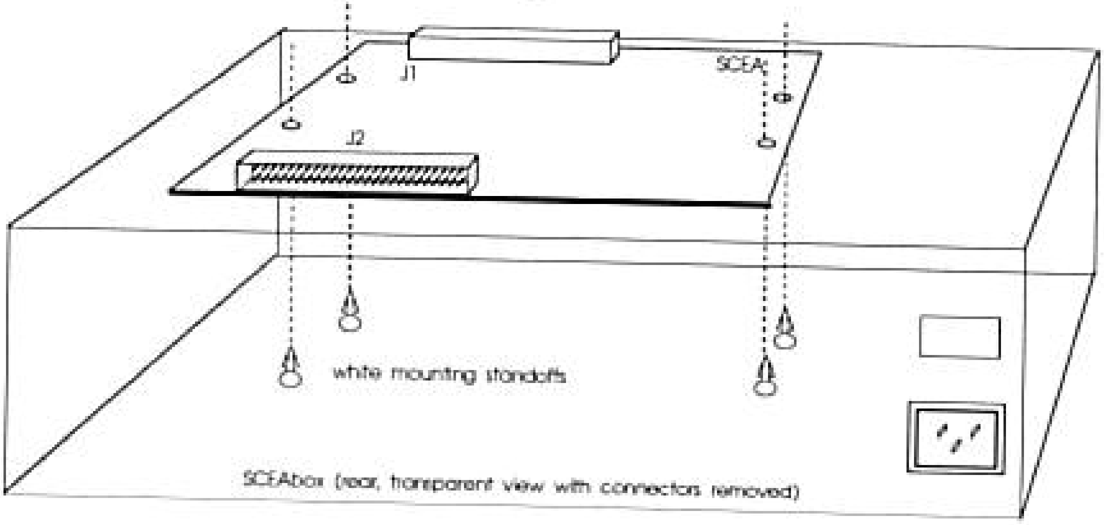


Figure 3-11: Installing the SCEA into the SCEAbox

8 Connect the two 3-pin black connectors from the Host SCSI ID selector (closest to power switch) to the Host SCSI Port ID jumper selections W12-1, W12-2, and W12-3. The blue wire should be on W12-1 and be close to U41. The brown wire should be on W12-3 and be close to C30 on the SCEA. See Figure 3-12.

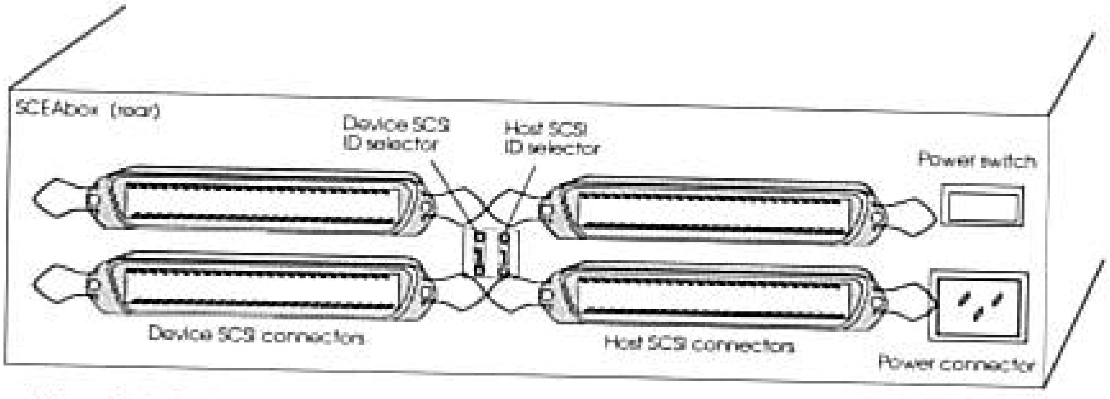


Figure 3-12: Device and Host ID selectors

9 Connect the two 3-pin black connectors from the Device SCSI ID selector to the Device SCSI Port ID jumper selections W13-1, W13-2, and W13-3. The blue wire should be on W13-1 and be close to U44. The brown wire should be on W13-3 and be close to U43 on the SCEA.

11 Set the SCSI ID for both the host and the device using the Device and Host SCSI ID selectors; press the top buttons to decrement the numbers and the bottom buttons to increment the numbers.

a Set the Host SCSI ID selector to 0. If another device on the SCSI bus has SCSI ID 0, set it to 1, 2, 3, or another number to (see Chapter 2, section "Host SCSI Port" for complete explanation of SCSI ID; see Figure 3-12 also for location of Host SCSI ID selector).

b Set the Device SCSI ID selector to 7. If another device on the SCSI bus has SCSI ID 7, set it to 6, 5, 4, or another number down to 0 (see Chapter 2, section "Device SCSI Port" for complete explanation of SCSI ID).

12 Terminate each *physical* end of the SCSI bus by following these instructions:

a If SCEA is not at one end of the SCSI bus, *remove terminators* at J1. For VAXstation 3100 and DECstation 5100 systems, *always remove terminators* at J1 (see Figure 3-5).

To remove terminators at J1:
Remove the three (3) terminators in locations RN1, RN3 and RN4 from the SCEA located near J1. Remove jumper shunt in W1 to disable TERMPWR at J1.

To install terminators at J1:
Put three (3) terminators in locations RN1, RN3 and RN4 near J1 (numbers must face J1). Put jumper shunt in W1 to supply TERMPWR (make sure the host computer is not supplying terminator power).

b DO NOT terminate devices in the middle of the SCSI bus; if the SCEA is in the middle of the SCSI bus; *remove terminators at J2.*

SCSI devices can be terminated directly on the device (see manufacturer's documentation) or by using an external terminator as shown in Figures 3-8.

To install terminators at J2:
Put three (3) terminators in locations RN17, RN18, and RN19 (numbers must face J1); put jumper shunt in W19 (this allows for +5-volts to be sent to the external terminator at the end of the SCSI bus).

To remove terminators at J2:
Remove the three (3) terminators in locations RN17, RN18, and RN19, next to J2 on the SCEA. W19, TERMPWR, may be removed if another device is supplying terminator power. See Figure 3-10.

c If you *do not* want the SCEA to supply terminator power (TERMPWR), remove jumper shunt at W19.

13 Close the SCEAbox carefully by sliding the cover of the TRIMM chassis from the front to the back. Make sure the two notches in the cover chassis are on top of the bottom chassis; this secures the box completely.

14 Put the three scews back into the back center and bottom front of the SCEAbox.

15 Plug the female end of the power cord into the back of the SCEAbox; plug the male end into a wall power outlet, see Figure 3-12.

16 Connect one end of an external SCSI cable to the Host SCSI connector at the back of the SCEAbox; either the top or bottom connector on the right side of the box can be used.

17 Connect the other end of the external SCSI cable to the host computer (align pin 1 of the cable to pin 1 of the connector).

18 Connect one end of an external SCSI cable to the Device SCSI connector at the back of the SCEAbox; this connector is either the top or bottom connector on the left side of the box.

19 Connect the other end of the external SCSI cable to the SCSI device connector (align pin 1 of the cable to pin 1 of the connector). Up to seven devices may be installed by correctly cabling to other SCSI devices as shown in Figures 3-8.

4

Configuration

This chapter details software configuration for the system to recognize devices located on the SCSI bus, the On-Board Utility to assist you in setting up the SCEA and your system and multi-hosting configuration for VMS. Remember, each device on each SCSI bus must have a unique SCSI ID number.

VMS, VAXstation Configuration

Your VMS system will auto-configure only LUN 0 for each SCSI ID; through the SCEA VMS recognizes the target device with SCSI ID 0 as LUN 0. Other devices LUN 1 to LUN 7 connected to the SCEA must be manually configured to the system using the VMS Sysgen Connect Statement.

Follow these instructions to configure your system for more than one LUN:

1. Be sure all cables are securely connected and termination is correct. See Sections "Installing the SCEA" and "Installing SCSI Devices."
2. Power "ON" and boot the system.

3 At the system prompt, $, enter one of the following statements for viewing the respective devices:

show dev dk	to view disk drives
show dev mk	to view tape drives
show dev gk	to view generic drives like jukeboxes

Determine from which SCSI port of the VAXstation the SCEA is connected, either A or B; *dka* or *dkb*, *mka* or *mkb*, or *gka* or *gkb* will display.

4 At the $ prompt, enter:

```
mc sysgen
```

5 After you have determined to which SCSI port of the VAXstation the SCEA is connected, at the *sysgen>* prompt, enter *one* of the following connect statements for each respective device (Table 4-1 lists mapping for the devices):

connect dkA#0?/noadapter	for disk drive on VAXstation SCSI port A
connect mkA#0?/noadapter	for tape drive on VAXstation SCSI port A
connect gkA#0?/noadapter	for generic drive on VAXstation SCSI port A
connect dkB#0?/noadapter	for disk drive on VAXstation SCSI port B
connect mkB#0?/noadapter	for tape drive on VAXstation SCSI port B
connect gkB#0?/noadapter	for generic drive on VAXstation SCSI port B

Where:
= the SCSI ID for J1 of the SCEA
? = the SCSI ID of device other than 0 on J2 SCSI bus (see the example on the next page).

DEC Alpha AXP systems use *sysman* to connect devices. At the $ prompt enter:

```
mcr sysman
```

At the *sysman>* prompt, enter one of the following connect statements for each respective device (Table 4-1 lists mapping for the devices):

io connect dkA#0?:/noadapter/drive=sys$dkdriver	for disk drive on Alpha SCSI port A
io connect mkA#0?:/noadapter/drive=sys$dkdriver	for tape drive on Alpha SCSI port A
io connect gkA#0?:/noadapter/drive=sys$gkdriver	for generic drive on Alpha SCSI port A
io connect dkB#0?:/noadapter/drive=sys$dkdriver	for disk drive on Alpha SCSI port B
io connect mkA#0?:/noadapter/drive=sys$mkdriver	for tape drive on Alpha SCSI port B
io connect dkA#0?:/noadapter/drive=sys$dkdriver	for generic drive on Alpha SCSI port B

Where:
= the SCSI ID for J1 of the SCEA
? = the SCSI ID of device other than 0 on J2 SCSI bus (see the example on the next page).

Table 4-1 Mapping for Drives

Target Device	Host Devices
SCSI ID 0	SCSI ID x, LUN 0
SCSI ID 1	SCSI ID x, LUN 1
SCSI ID 2	SCSI ID x, LUN 2
SCSI ID 3	SCSI ID x, LUN 3
SCSI ID 4	SCSI ID x, LUN 4
SCSI ID 5	SCSI ID x, LUN 5
SCSI ID 6	SCSI ID x, LUN 6

For example, our VAXstation recognized the disk drive located at LUN 0; it did not recognize the jukebox which consists of two devices—the drive and the robotics. For the jukebox, configured to SCSI ID 2 (jukebox drive) and SCSI ID 3 (robotics), we entered *gka102* for generic drive SCSI ID 1 (SCEA) LUN 2, then entered *gka103* for generic drive SCSI ID 1 (SCEA) LUN 3. See Figure 4-1 for details.

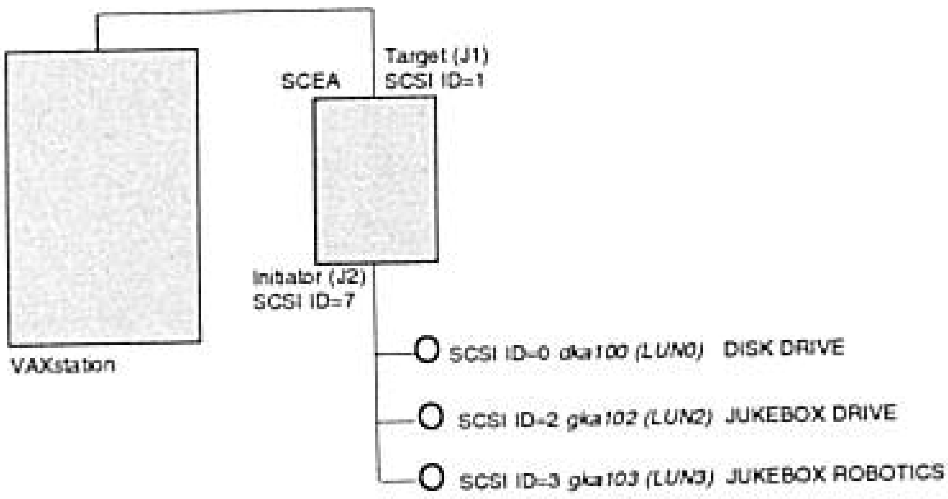

Target (J1)
SCSI ID=1
SCEA
Initiator (J2)
SCSI ID=7
VAXstation
SCSI ID=0 *dka100 (LUN0)* DISK DRIVE
SCSI ID=2 *gka102 (LUN2)* JUKEBOX DRIVE
SCSI ID=3 *gka103 (LUN3)* JUKEBOX ROBOTICS

Figure 4-1: SCSI ID and LUN for VAXstation

6 When completed, at the *sysgen>* prompt enter:

exit

To view all disk devices, use *show dev dk* as explained in number **3**, *show dev mk* for tape devices, or *show dev gk* for generic devices.

SunOS Configuration

To configure your system using SunOS version of Unix, follow the instructions below.

1 Enter the following line at the system prompt:

cd /usr/kvm/sys/sun4c/conf

Where
sun4c = SPARCstation or SPARCserver and the number is the old lines.

NOTE This directory is for a typical SPARCstation. Your configuration may be somewhat different.

2 Copy your configuration file to a new name, for example *"SCEA"*

cp <your configuration file> SCEA

3 Open the *SCEA* file just created.

4 Locate the target SCSI ID number that is not being used and set it for use with the SCEA.

5 Add a line to the *SCEA* file to reflect the presence of the SCEA and devices connected by performing the following procedures:

   a Locate configuration regarding SCSI (using the *vi* Editor, search for SCSI by entering */scsi*).

   b Add the following statement to show SCSI ID numbers set for the SCEA and its respective devices (see Table 4-1 and the example in Figure 4-2 for appropriate SCSI identification). ***DO NOT*** edit lines with existing devices!

```
disk sd✣ at scsibus ✣  target ✣ lun ✣
```

NOTE There is no space between *sd* and ✣

Where:
✣ in *sd* = the numeric variable given to represent the SCSI device (this number will show in the */dev* directory as */dev/sd1*, for example)
✣ for *scsibus* = available bus (usually 0 unless another SCSI adapter board has been added)
✣ for *target* = SCSI ID number for Host SCSI Port (J1, SCEA)
✣ for *lun* = SCSI ID number for the device (set on the device).

The following is an example of a configuration file (see Figure 4-2):

```
disk sd1 scsibus 0 at target 1 lun 1
disk sd2 scsibus 0 at target 1 lun 2
disk sd3 scsibus 0 at target 1 lun 4
```

In this example, *target 1* represents the SCSI ID of the SCEA at J1; *lun 1* is the logical unit number (LUN) of the target device from J2 and is named *sd1*; the second target device at *lun 2* is named *sd2*, another target device at *lun 4* is named *sd3*.

5 Save the *SCEA* file (in *vi* editor, the command is **ZZ**).

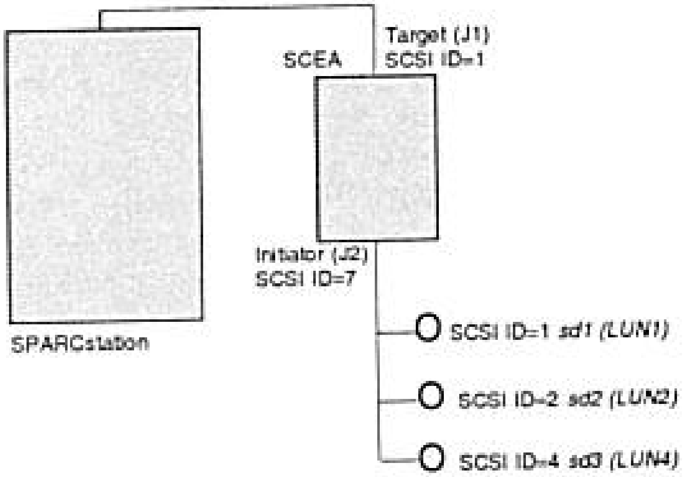


Figure 4-2: SCSI ID and LUN for SPARCstation

6 Run *config* by entering the following statement; the screen will then display the message, *Doing a "make depend."*

```
config  SCEA
```

7 Enter the following to generate the file *vmunix*:

```
cd ../SCEA
make
```

8 At the prompt, enter the following statement:

```
cp ./vmunix /vmunix.new
shutdown
halt
```

9 The system halts and displays the prompt, boot the system in single-user mode by entering:

```
b /vmunix.new -s
```

10 Test the system, if it works, save the old kernel under a different file name and install the new one in */vmunix* by entering the following commands:

```
cd /
mv vmunix vmunix.sav
mv vmunix.new vmunix
```

NOTE Make sure the new version is accurately spelled *vmunix*.

11 Reboot the system.

ULTRIX, DECstation Configuration

Follow the steps below to configure your system; first note the example below. This section describes procedures to configure and add new devices to ULTRIX running on a DECstation.

1 Enter the following at the system prompt:

```
cd /sys/conf/mips
```

2 Copy your configuration file to a new name, for example, "SCEA:"

```
cp <your config file> SCEA
```

3 Edit the SCEA file just created.

4 For each medium changer, add a disk device corresponding to the SCSI ID setting of its associated SCEA/J board.

NOTE Since ULTRIX does not support LUNs, the medium changer's SCSI ID must be 0).

```
disk rz* at <type>? drive #
```

where:
* = disk unit number from 0 to 7.
# = SCSI ID number of the medium changer's SCEA/J board (as seen from the host side).

<type> = controller type: *asc, scsi,* or *sii* .
? = controller number.

NOTE Disk unit and SCSI ID numbers do not have to match.

5 If you are configuring a tape stacker, add a tape device corresponding to the SCSI ID setting of each tape drive.

tape tz* at <type>? drive #

where:
* = disk unit number from 0 to 7.
# = SCSI ID number of the tape drive.
<type> = controller type: *asc, scsi,* or *sii.*
? = controller number.

If you are configuring a jukebox, add a disk device corresponding to the SCSI ID setting of each MO drive's SCEA/E board.

NOTE Since ULTRIX does not support LUNs, the MO drives' SCSI IDs must be 0).

disk rz* at <type>? drive #

where:
* = disk unit number from 0 to 7.
# = SCSI ID number of the MO drive's SCEA/E board (as seen from the host side).
<type> = controller type: *asc, scsi,* or *sii.*
? = controller number.

6 Save the SCEA file and generate the new *vmunix* kernel.

```
config SCEA
cd ../../MIPS/SCEA
make clean
make depend
make
```

7 If you are in multi-user mode, shut it down to single-user mode:

```
/etc/shutdown +5 "Building new kernel"
```

8 Save the old kernel and boot with the new kernel.

```
mv /vmunix /vmunix.old
mv ./vmunix /vmunix
chmod 755 /vmunix
/etc/reboot
```

9 Make system special files for each device which was configured above.

```
cd /dev
```

For each disk unit, type:

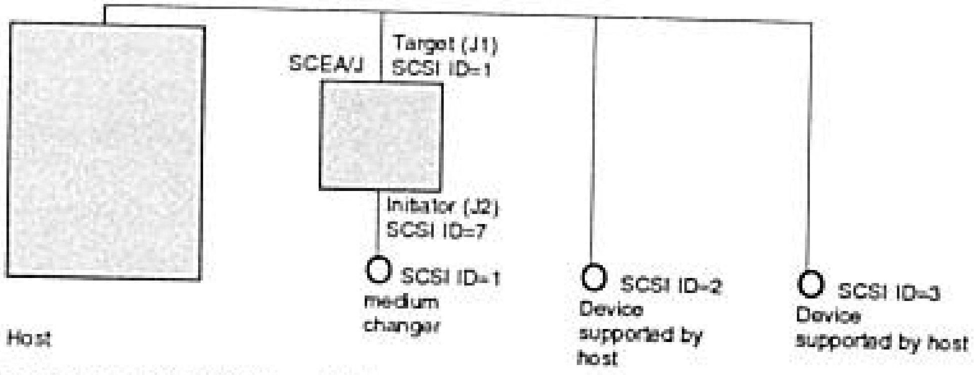
```
makedev rz#
```

For each tape unit, type:

```
makedev tz#
```

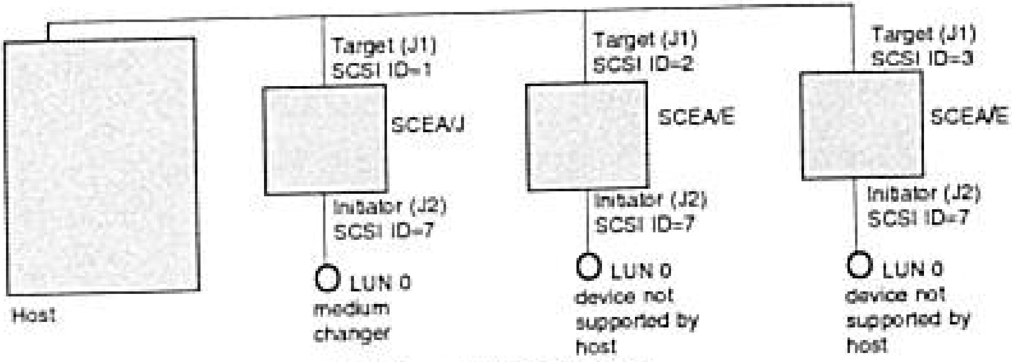
where
= the corresponding unit number.

Don't forget to make note of the corresponding device numbers as they appear on the screen. See Figure 4-3 and 4-4.



This diagram is for SCSI IDs and LUNs for workstations that do not support LUNs with devices supported by the host.

Figure 4-3: SCSI ID and LUN for workstation



This diagram is for SCSI IDs and LUNs for workstations that do not support LUNs with devices supported by the host.

Figure 4-4: SCSI ID and LUN for workstation

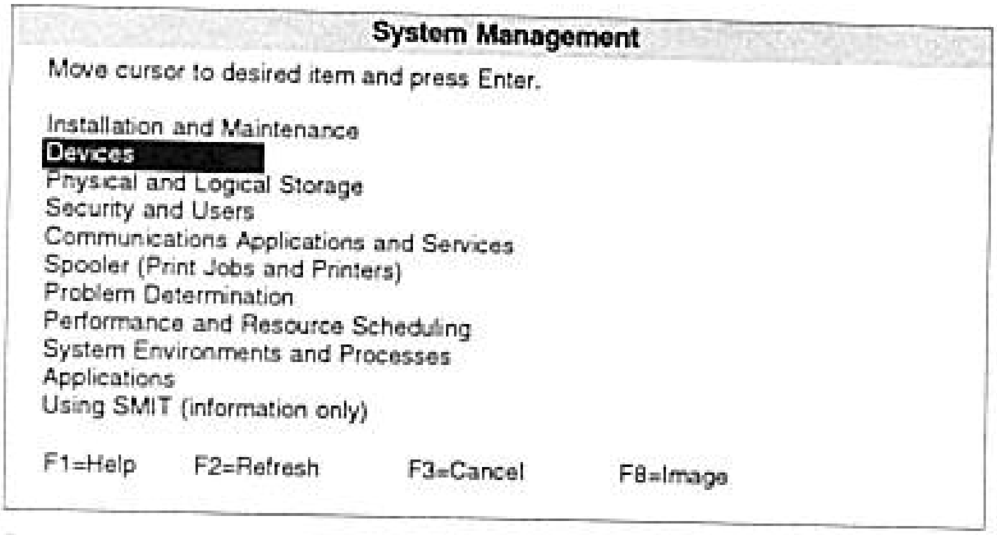
AIX, IBM RISC System/6000 Configuration

Once the SCEA is installed and the RISC System/6000 is powered "ON," AIX will check the SCSI bus for devices. It will autoconfigure all devices directly connected to the SCSI bus and those connected to the Device SCSI Port of the SCEA. Follow these procedures after the system has checked for all devices on the SCSI bus if you have IBM AIX Rev. 3.1 operating system. For other AIX
revisions please consult AIX documentation.

NOTE When selecting a SCSI ID number for the SCEA, do not use 0 (zero), since it is the SCSI ID of the system disk. SCEA Device SCSI Port (J2) must be set to SCSI ID 7 so the system will recognize it as the controller.

Version detailed in this chapter is AIX version 3.1.5.

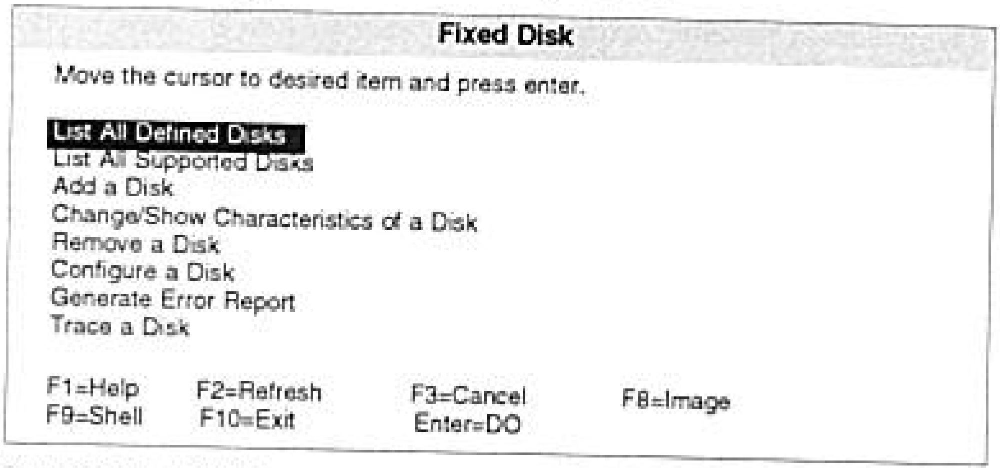
1. Login to the RISC System/6000.
2. Type *smit* at the # prompt or select *the smit icon* on MOTIF windows.
3. At the "System Management Menu" shown below, select "Devices" and press **[ENTER]**.



```
System Management
Move cursor to desired item and press Enter.

Installation and Maintenance
Devices
Physical and Logical Storage
Security and Users
Communications Applications and Services
Spooler (Print Jobs and Printers)
Problem Determination
Performance and Resource Scheduling
System Environments and Processes
Applications
Using SMIT (information only)

F1=Help      F2=Refresh       F3=Cancel       F8=Image
```

Figure 4-5: System Management Menu

4 From the "Devices Menu," select "Fixed Disk" and press **[ENTER]** and the menu will appear as shown in Figure 4-6.

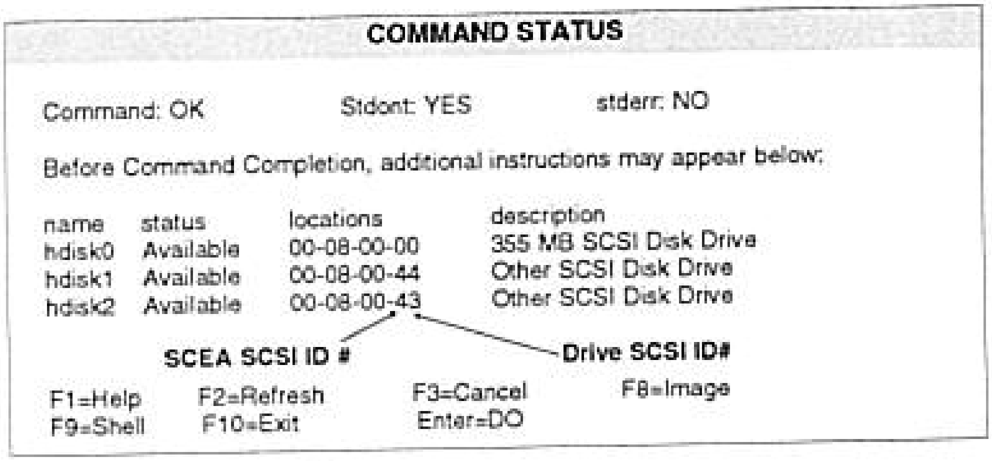


```
Fixed Disk
Move the cursor to desired item and press enter.

List All Defined Disks
List All Supported Disks
Add a Disk
Change/Show Characteristics of a Disk
Remove a Disk
Configure a Disk
Generate Error Report
Trace a Disk

F1=Help      F2=Refresh       F3=Cancel       F8=Image
F9=Shell     F10=Exit         Enter=DO
```

Figure 4-6: Fixed Disk Menu

5 Select "List All Defined Disks" and press **[ENTER]**.

NOTE For the following examples, the SCEA SCSI ID is 4.



```
                         COMMAND STATUS

Command: OK              Stdont: YES              stderr: NO

Before Command Completion, additional instructions may appear below:

name     status       locations        description
hdisk0   Available    00-08-00-00      355 MB SCSI Disk Drive
hdisk1   Available    00-08-00-44      Other SCSI Disk Drive
hdisk2   Available    00-08-00-43      Other SCSI Disk Drive
```

Figure 4-7: Command Status Menu

6 The screen should display the devices. Devices recognized by the system will be stated as "Available." Devices stated as "Defined" have been previously set up and are not presently being seen by the system.

7 Make sure the SCSI ID that shows up on the system is the same as the SCSI ID you configured for the device. For example, the SCEA is set to SCSI ID 4 (Host SCSI Port, J1) and the first device SCSI ID 1, and the second device is SCSI ID 3. The system must display the last two digits as 44 and 43.

8 Press **[F10]** to quit, or press **[F3]** to cancel out of the screens until you return to the "System Management Menu."

9 Once you have completed these procedures, you need to complete the following tasks:

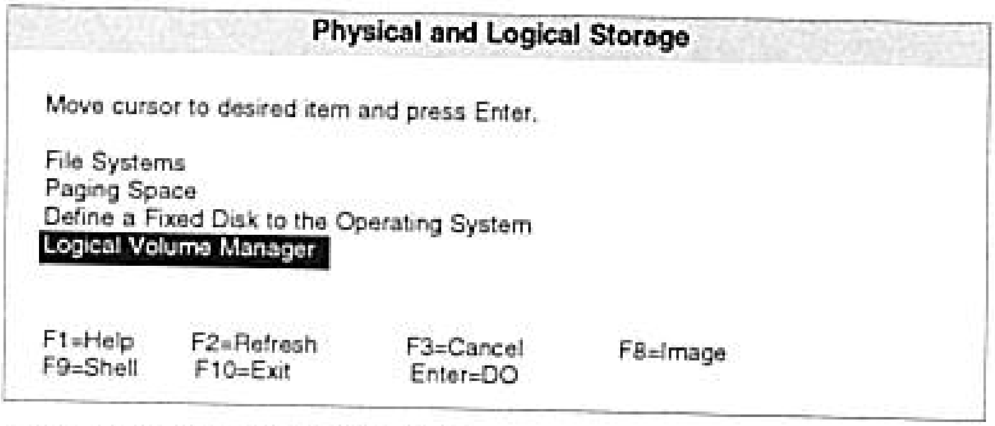
- Create a Volume Group
- Create a Logical Volume
- Create a File System
- Mount the File System

Creating a Volume Group

Follow these procedures to create a volume group. You will begin at the "System Management Menu."

NOTE Press **[F1]** for help when needed; options are displayed on the bottom of each menus.

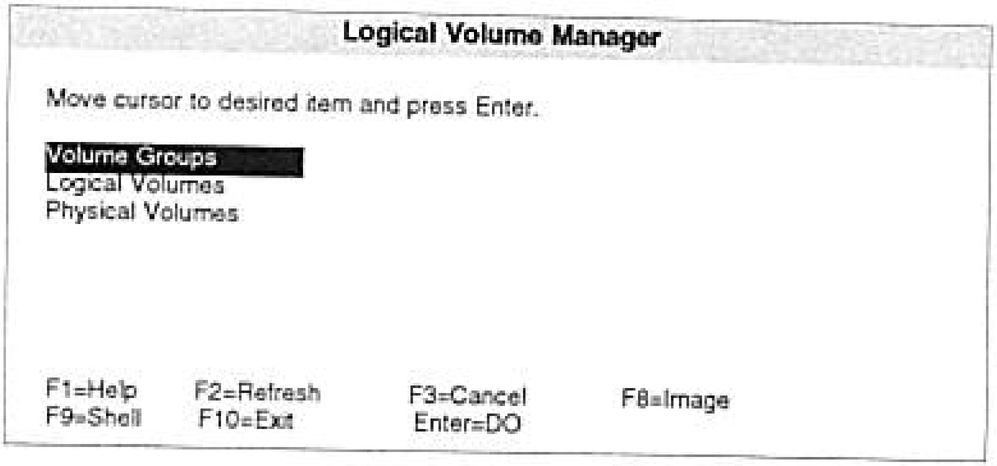
1 At the "System Management Menu," select "Physical and Logical Storage," and the menu will appear as shown in Figure 4-8.



Move cursor to desired item and press Enter.

Figure 4-8: Pysical and Logical Storage Menu

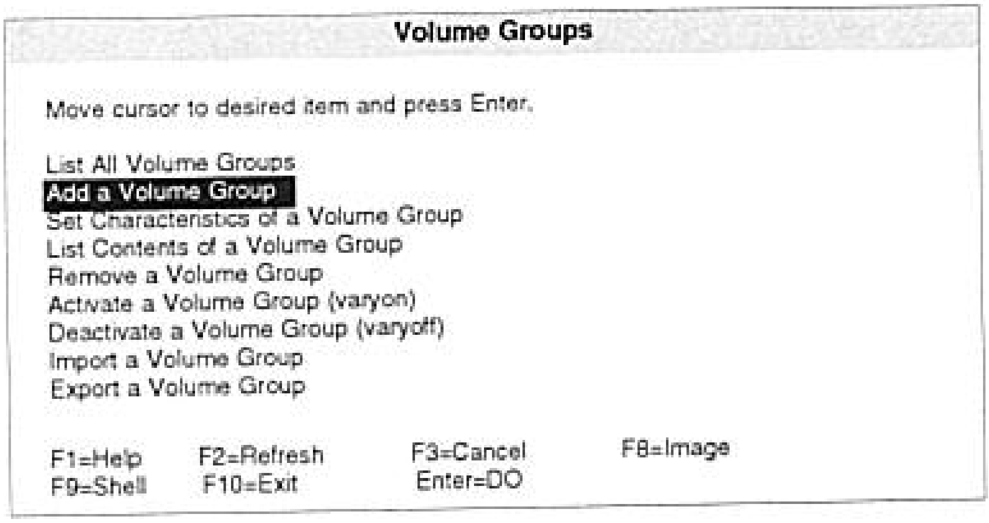
2 Select "Logical Volume Manager Menu," and the menu will appear as shown in Figure 4-9.



Move cursor to desired item and press Enter.

Figure 4-9: Logical Volume Manager Menu

3 Select "Volume Groups," and the menu will appear as shown in Figure 4-10.

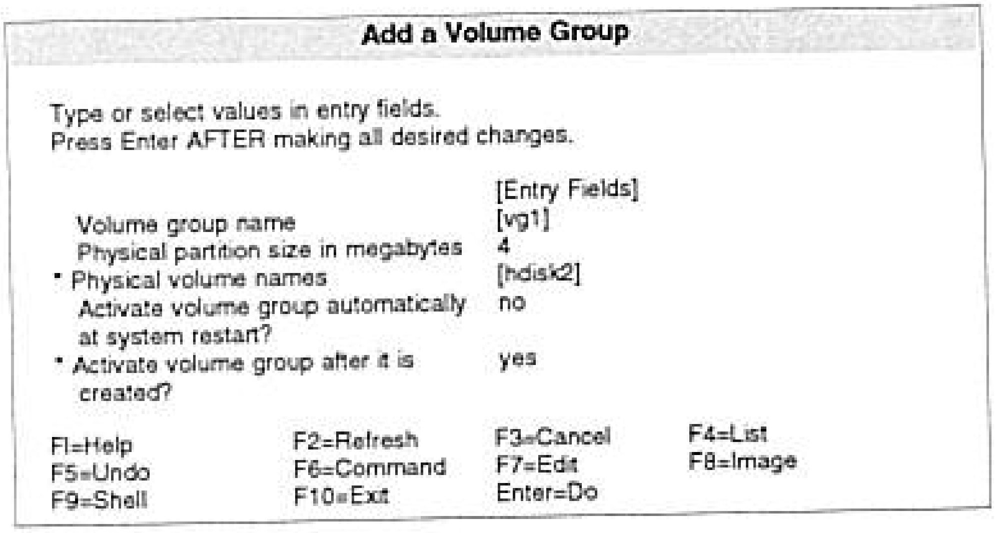


```
                         Volume Groups

Move cursor to desired item and press Enter.

List All Volume Groups
Add a Volume Group
Set Characteristics of a Volume Group
List Contents of a Volume Group
Remove a Volume Group
Activate a Volume Group (varyon)
Deactivate a Volume Group (varyoff)
Import a Volume Group
Export a Volume Group

F1=Help      F2=Refresh        F3=Cancel        F8=Image
F9=Shell     F10=Exit          Enter=DO
```

Figure 4-10: Volume Groups Menu

4 Select "Add a Volume Group," and the menu will appear as shown in Figure 4-11.

NOTE Press **[F4]** for a listing of the items; press **[F1]** for help. Press the **[↑]** or **[↓]** to move through the menu; press **[ENTER]** to create/engage.



```
                       Add a Volume Group

Type or select values in entry fields.
Press Enter AFTER making all desired changes.

                                                [Entry Fields]
  Volume group name                             [vg1]
  Physical partition size in megabytes          4
* Physical volume names                         [hdisk2]
  Activate volume group automatically           no
  at system restart?
* Activate volume group after it is             yes
  created?

Fl=Help              F2=Refresh      F3=Cancel      F4=List
F5=Undo              F6=Command      F7=Edit        F8=Image
F9=Shell             F10=Exit        Enter=Do
```

Figure 4-11: Add a Volume Group, Menu 1

5 Enter the information in this menu as listed below:

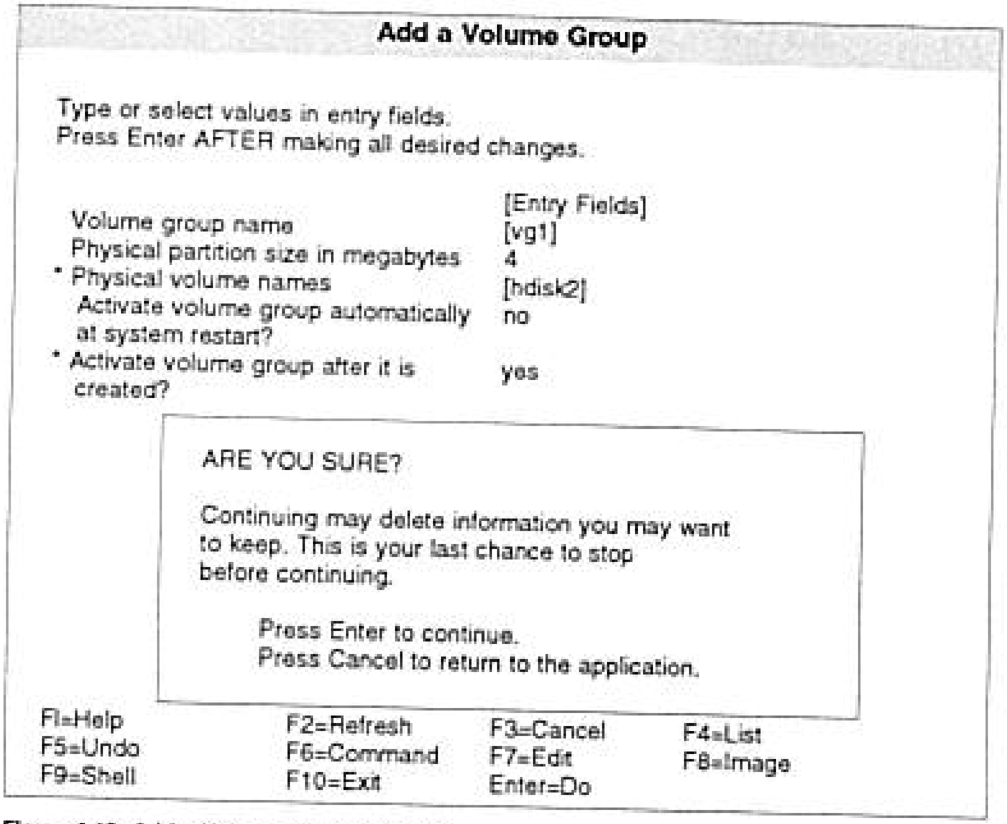
NOTE Features not listed are optional.

VOLUME GROUP NAME—Enter the name you choose for the volume group (eg., *vg1*).

PHYSICAL PARTITION SIZE IN MEGABYTES—Press **[TAB]** to scan through the choices (eg., *4-MB*).

PHYSICAL VOLUME NAMES—Enter the same name used before as stated in Figure 4-7 (eg., *hdisk2*).

6 Press **[ENTER]**, the menu will appear as shown in Figure 4-12.

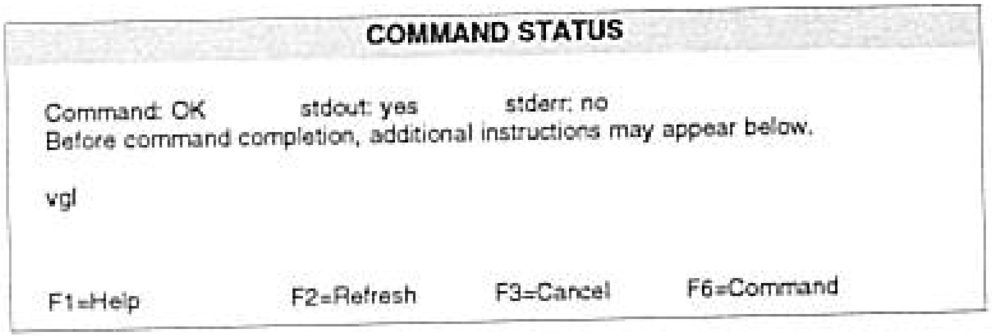


```
                       Add a Volume Group

 Type or select values in entry fields.
 Press Enter AFTER making all desired changes.

                                             [Entry Fields]
   Volume group name                         [vg1]
   Physical partition size in megabytes      4
 * Physical volume names                     [hdisk2]
   Activate volume group automatically       no
    at system restart?
 * Activate volume group after it is         yes
    created?

        ARE YOU SURE?

        Continuing may delete information you may want
        to keep. This is your last chance to stop
        before continuing.

            Press Enter to continue.
            Press Cancel to return to the application.

 Fl=Help          F2=Refresh       F3=Cancel      F4=List
 F5=Undo          F6=Command       F7=Edit        F8=Image
 F9=Shell         F10=Exit         Enter=Do
```

Figure 4-12: Add a Volume Group, Menu 2

7 Press **[ENTER]** again and the menu will appear as shown in Figure 4-13.

NOTE System will display "Running" and later change to "OK" when completed.



```
                         COMMAND STATUS

Command: OK          stdout: yes          stderr: no
Before command completion, additional instructions may appear below.

vgl


F1=Help              F2=Refresh          F3=Cancel          F6=Command
```

Figure 4-13: Command Status Menu

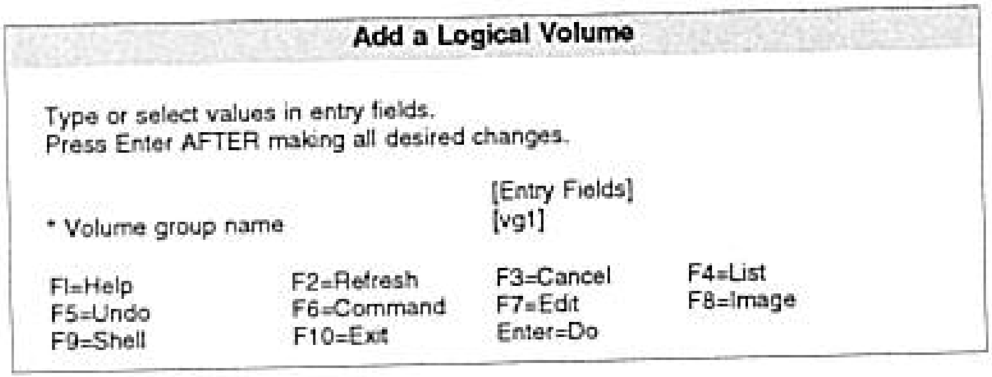
8 Press **[F3]** to cancel out of the screens until you return to the "Logical Volume Manager Menu." (See Figure 4-7.)

Creating a Logical Volume

To create a logical volume, follow these steps.

1 At the "Logical Volume Manager Menu," select "Logical Volumes."

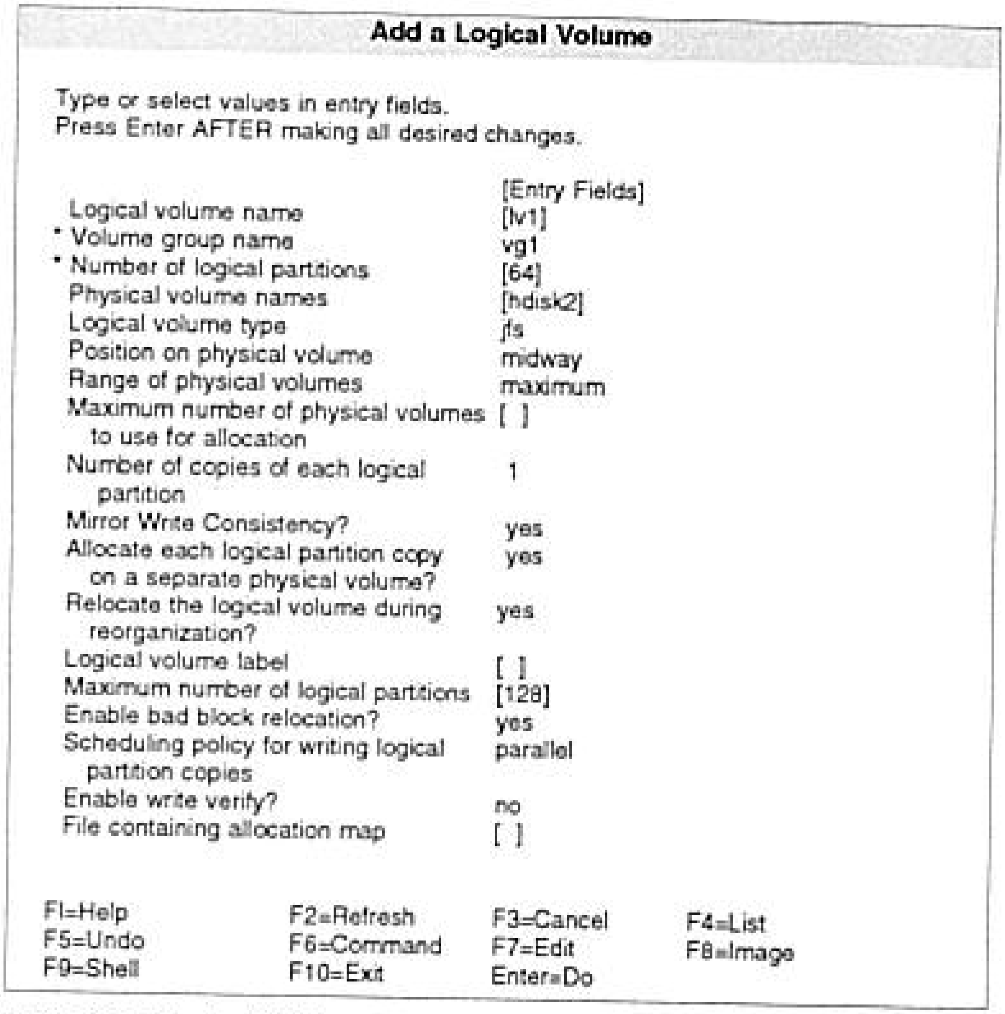
2 Then select "Add a Logical Volume," and the menu will appear as shown in Figure 4-14.



```
                       Add a Logical Volume

Type or select values in entry fields.
Press Enter AFTER making all desired changes.

                                          [Entry Fields]
* Volume group name                       [vg1]

Fl=Help              F2=Refresh          F3=Cancel          F4=List
F5=Undo              F6=Command          F7=Edit            F8=Image
F9=Shell             F10=Exit            Enter=Do
```

Figure 4-14: Add a Logical Volume, Menu 1

3 Enter the volume group name you just created, eg., *vg1* (or press **[F4]** for a listing). Press **[ENTER]** and the menu will appear as shown in Figure 4-15.



```
                          Add a Logical Volume

Type or select values in entry fields.
Press Enter AFTER making all desired changes.

                                                [Entry Fields]
  Logical volume name                           [lv1]
* Volume group name                             vg1
* Number of logical partitions                  [64]
  Physical volume names                         [hdisk2]
  Logical volume type                           jfs
  Position on physical volume                   midway
  Range of physical volumes                     maximum
  Maximum number of physical volumes            [ ]
    to use for allocation
  Number of copies of each logical               1
     partition
  Mirror Write Consistency?                      yes
  Allocate each logical partition copy           yes
    on a separate physical volume?
  Relocate the logical volume during            yes
    reorganization?
  Logical volume label                          [ ]
  Maximum number of logical partitions          [128]
  Enable bad block relocation?                  yes
  Scheduling policy for writing logical         parallel
    partition copies
  Enable write verify?                          no
  File containing allocation map                [ ]

Fl=Help              F2=Refresh          F3=Cancel          F4=List
F5=Undo              F6=Command          F7=Edit            F8=Image
F9=Shell             F10=Exit            Enter=Do
```

Figure 4-15: Add a Logical Volume, Menu 2

4 Enter the information in the fields using the arrow keys to move through the fields as listed below (features not mentioned below are optional and/or for your preference):

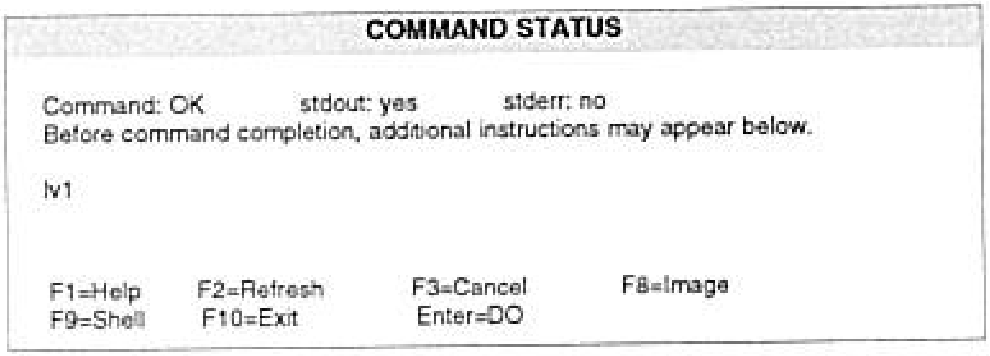
LOGICAL VOLUME NAME—Enter the name you choose for the logical volume (eg., *lv1*).

VOLUME GROUP NAME—Press [↓] to pass through this feature. Volume Group Name has been already specified (eg., *vg1*).

NUMBER OF LOGICAL PARTITIONS—This number is proportional to the size of the disk (eg., *64*).

PHYSICAL VOLUME NAMES—Enter the same name used before as stated in Figure 4-7 (eg., *hdisk2*).

5 Press **[ENTER]** when completed. The Command Status will display as shown in Figure 4-16.



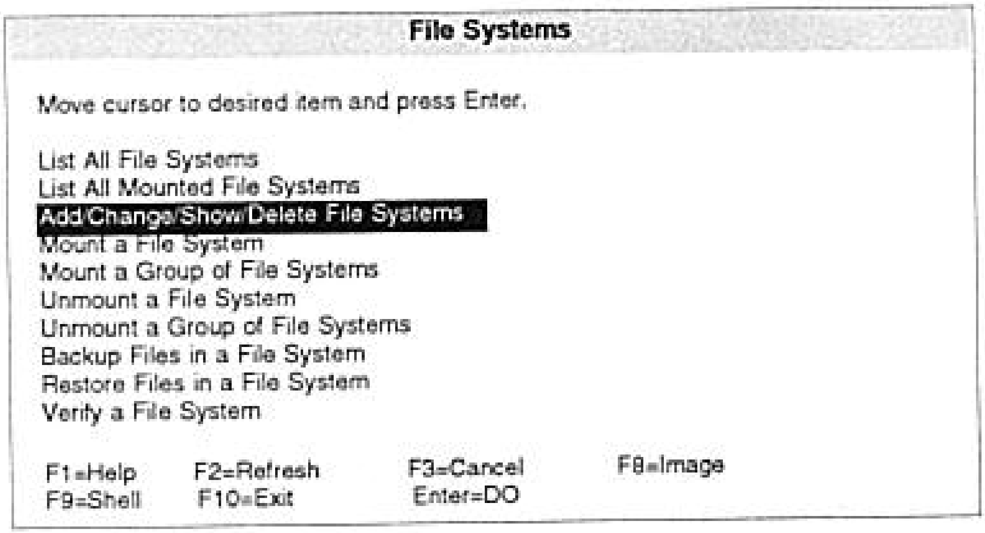
```
                          COMMAND STATUS

Command: OK           stdout: yes          stderr: no
Before command completion, additional instructions may appear below.

lv1


F1=Help        F2=Refresh         F3=Cancel         F8=Image
F9=Shell       F10=Exit           Enter=DO
```

Figure 4-16: Command Status Menu

Creating a File System

To create a file system, follow these steps.

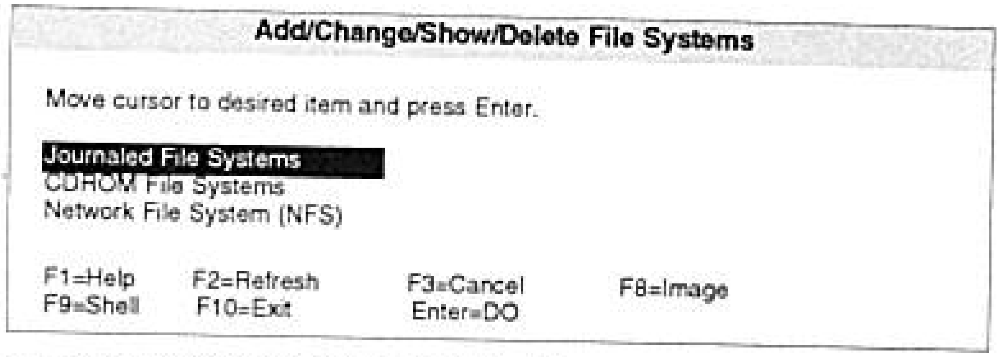
1 At the "Physical and Logical Storage Menu," select "File Systems" and the menu will appear as shown in Figure 4-17.



```
                           File Systems

Move cursor to desired item and press Enter.

List All File Systems
List All Mounted File Systems
Add/Change/Show/Delete File Systems
Mount a File System
Mount a Group of File Systems
Unmount a File System
Unmount a Group of File Systems
Backup Files in a File System
Restore Files in a File System
Verify a File System

F1=Help        F2=Refresh         F3=Cancel         F8=Image
F9=Shell       F10=Exit           Enter=DO
```

Figure 4-17: File Systems Menu

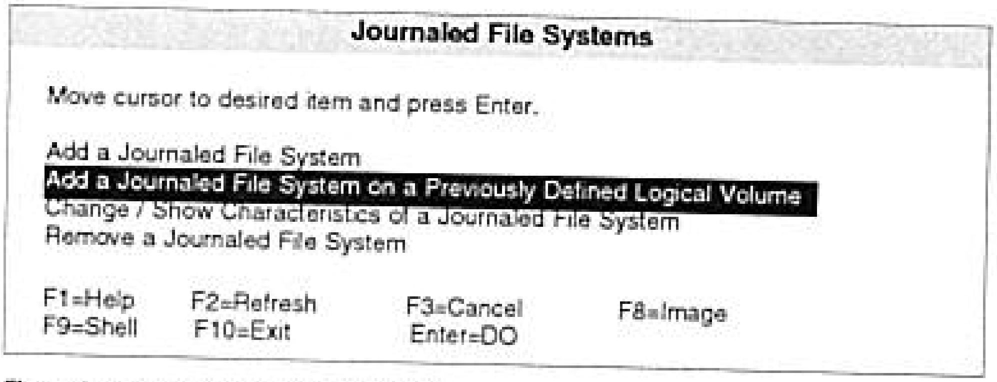
2 Select "Add/Change/Show/Delete File Systems" and the menu will appear as shown in Figure 4-18.



```
                 Add/Change/Show/Delete File Systems

Move cursor to desired item and press Enter.

Journaled File Systems
CDROM File Systems
Network File System (NFS)

F1=Help        F2=Refresh        F3=Cancel        F8=Image
F9=Shell       F10=Exit          Enter=DO
```

Figure 4-18: Add/Change/Show/Delete File Systems Menu

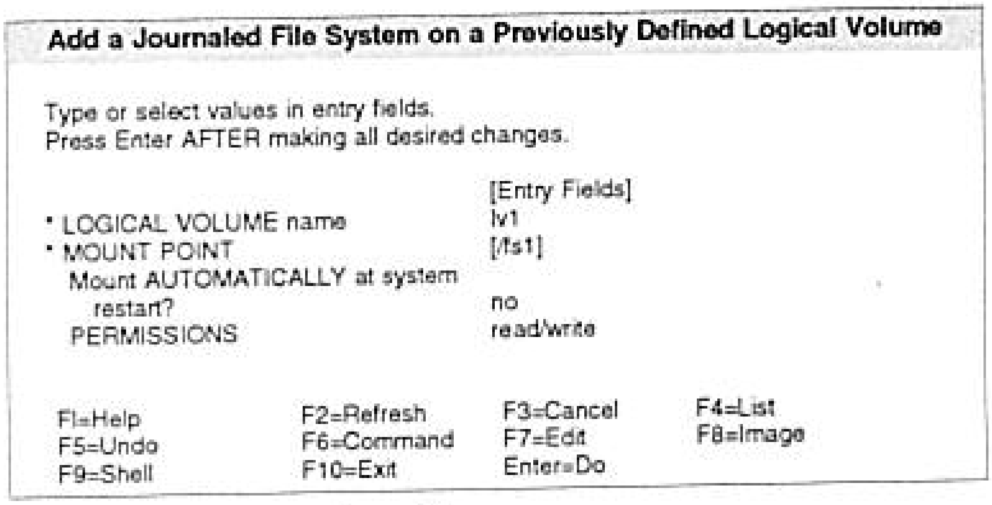
3 Select "Journaled File Systems" and the menu will appear as shown in Figure 4-19.



```
                      Journaled File Systems

Move cursor to desired item and press Enter.

Add a Journaled File System
Add a Journaled File System on a Previously Defined Logical Volume
Change / Show Characteristics of a Journaled File System
Remove a Journaled File System

F1=Help        F2=Refresh        F3=Cancel        F8=Image
F9=Shell       F10=Exit          Enter=DO
```

Figure 4-19: Journaled File Systems Menu

4 Select "Add a Journaled File System on a Previously Defined Logical Volume" and the menu will appear as shown in Figure 4-20.



```
Add a Journaled File System on a Previously Defined Logical Volume

Type or select values in entry fields.
Press Enter AFTER making all desired changes.

                                          [Entry Fields]
* LOGICAL VOLUME name                     lv1
* MOUNT POINT                             [/fs1]
  Mount AUTOMATICALLY at system
     restart?                             no
  PERMISSIONS                             read/write


 Fl=Help           F2=Refresh       F3=Cancel      F4=List
 F5=Undo           F6=Command       F7=Edit        F8=Image
 F9=Shell          F10=Exit         Enter=Do
```

Figure 4-20: Add a Journal File System Menu

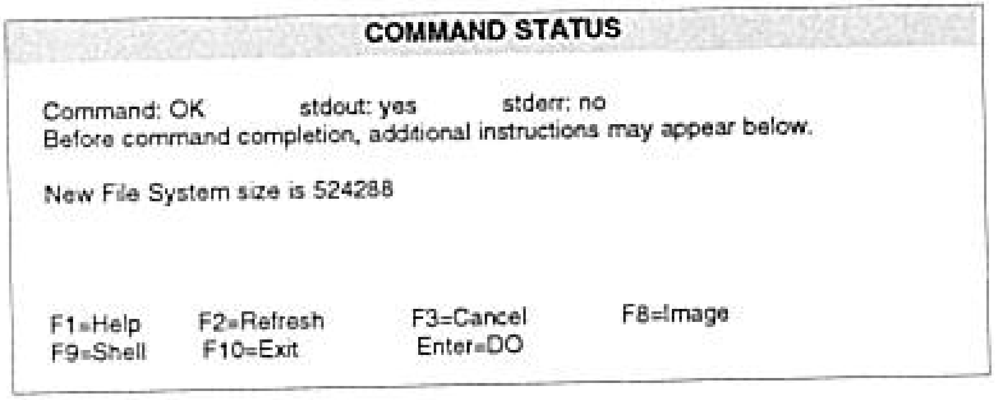
5 Enter the information in the fields as listed below using the arrow keys to move through the fields:

LOGICAL VOLUME NAME—Press **[F4]** to select the logical volume name you previously created (eg., *lv1*). See Figure 4-15.

MOUNT POINT—Enter the name of the file system; this name you will be able to use in the future to mount the file system (eg., */fs1*).

6 Press **[ENTER]** when completed. The Command Status will display as shown in Figure 4-21.

NOTE The new file system size number is dependent on previous set configuration.



```
                         COMMAND STATUS

Command: OK         stdout: yes         stderr: no
Before command completion, additional instructions may appear below.

New File System size is 524288



F1=Help     F2=Refresh       F3=Cancel       F8=Image
F9=Shell    F10=Exit         Enter=DO
```

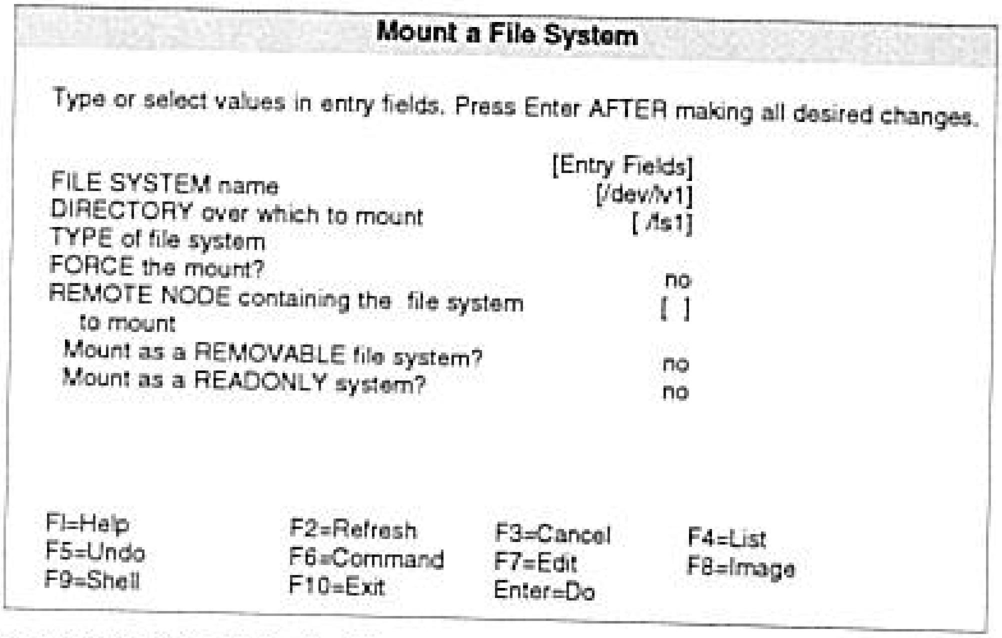
Figure 4-21: Command Status Menu

7 Press **[F3]** to cancel out of the screens until you return to "File Systems Menu."

Mounting the File System

To mount a file system follow these steps.

1 At the "File Systems Menu," select " Mount a File System" and the menu will appear as shown in Figure 4-22.



```
                         Mount a File System

Type or select values in entry fields. Press Enter AFTER making all desired changes.

                                                    [Entry Fields]
FILE SYSTEM name                                      [/dev/lv1]
DIRECTORY over which to mount                         [ /fs1]
TYPE of file system
FORCE the mount?                                         no
REMOTE NODE containing the  file system                  [ ]
   to mount
 Mount as a REMOVABLE file system?                       no
 Mount as a READONLY system?                             no




Fl=Help            F2=Refresh        F3=Cancel        F4=List
F5=Undo            F6=Command        F7=Edit          F8=Image
F9=Shell           F10=Exit          Enter=Do
```

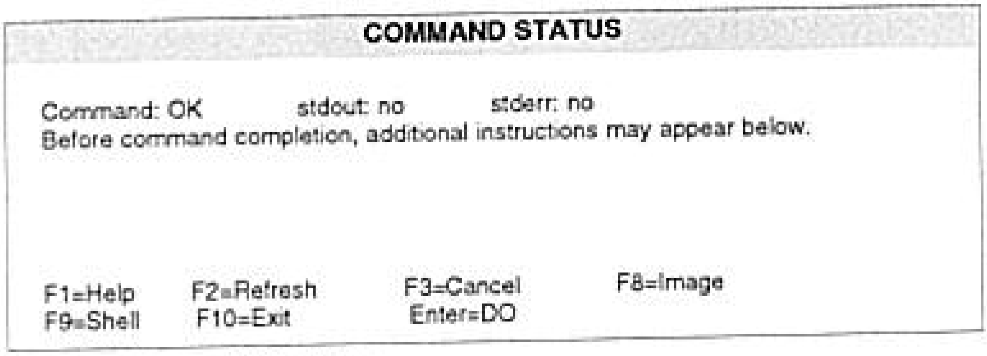
Figure 4-22: Mount a File System Menu

2 Enter the information in the fields using the arrow keys to move through the fields as shown below (fields not mentioned are user selectable, press **[F1]** for help):

FILE SYSTEM NAME—Press **[F4]** for a listing; select the approprate name (eg., */dev/lv1*).

DIRECTORY OVER WHICH TO MOUNT—Press **[F4]** for a listing; select the approprate directory (eg., */fs1*).

3 Press **[ENTER]** when completed. The Command Status will display as shown in Figure 4-23.



```
                         COMMAND STATUS

Command: OK          stdout: no          stderr: no
Before command completion, additional instructions may appear below.
```

Figure 4-23: Command Status Menu

4 Press **[F3]** to cancel out of the screens or press **[F10]** to exit out of *smit*.

Adding a Disk After the SCEA is in the System

To add a disk after the SCEA has been configured in the system follow these instructions:

1 From the "Fixed Disk Menu" select "Add a Disk."

2 At the "Disk Type Menu" select ***osdisk scsi Other SCSI Disk Drive*** and press **[ENTER]**.

3 At the "Parent Adapter Screen," hit **[ENTER]**.

4 At the "Add Disk Screen," the *CONNECTION Address* will be lit; enter the SCSI ID for the SCEA and then the drive SCSI ID number (LUN to AIX). For example, enter ***44*** and press **[ENTER]**.

5 Press **[F10]** to exit *smit* or **[F3]** to cancel out of that screen.

CMD SCSI Interface Boards

Your SCEA may be configured for use with any of CMD's other products listed below:

CBI-1000	(VAXBI-bus)
CQD-200/203	(Q-bus)
CQD-220/223	(Q-bus)
CQD-240/243	(Q-bus)
CQD-260/263	(Q-bus)
CDU-700	(Unibus)
CDU-710/712	(Unibus)
CDU-720/722	(Unibus)

Since these products interface between VAXBI-bus, Q-bus, or Unibus and the SCSI bus, the SCEA can be installed and play the role of a SCSI device. Simply configure the SCEA to meet the specifications for your operating system as listed in the previous subsections.

On-Board Utility

The On-Board Utility can test the system slot, SCSI cable, and SCSI devices connected to the SCEA. Be sure to complete utility functions, explained at the end of this chapter.

Accessing the Utility Through the RS-232 Port

To access the utility, follow the instructions below.

1. Connect a terminal to the SCEA's RS-232 port (10-pin connector). See Figure 4-8.

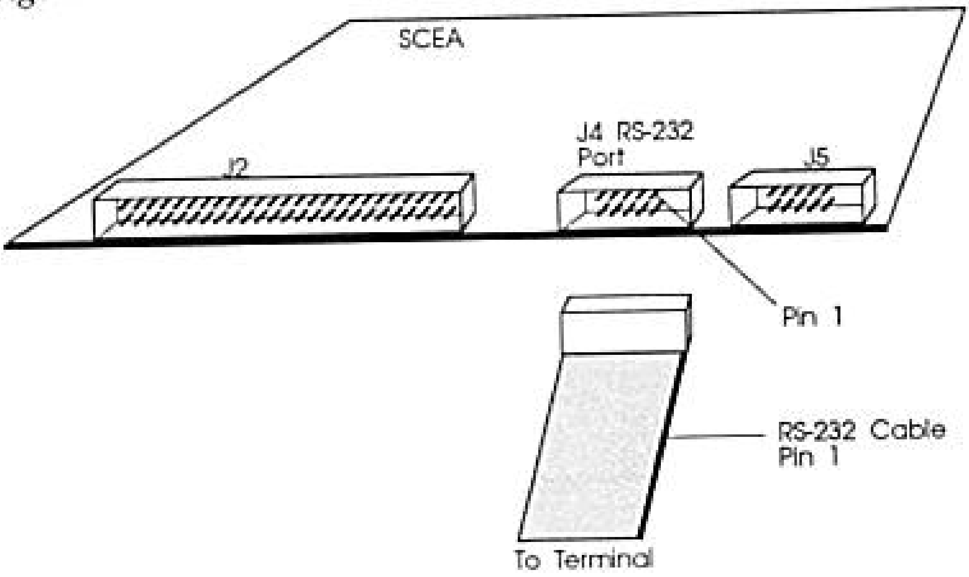


Figure 4-24: SCEA RS-232 Port

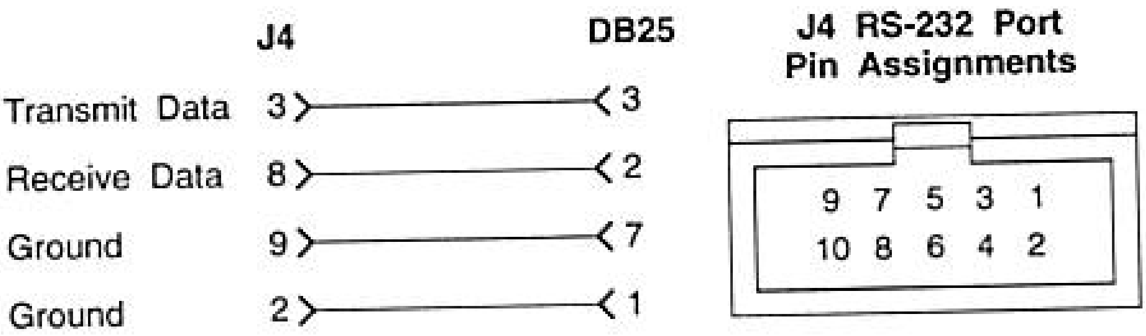
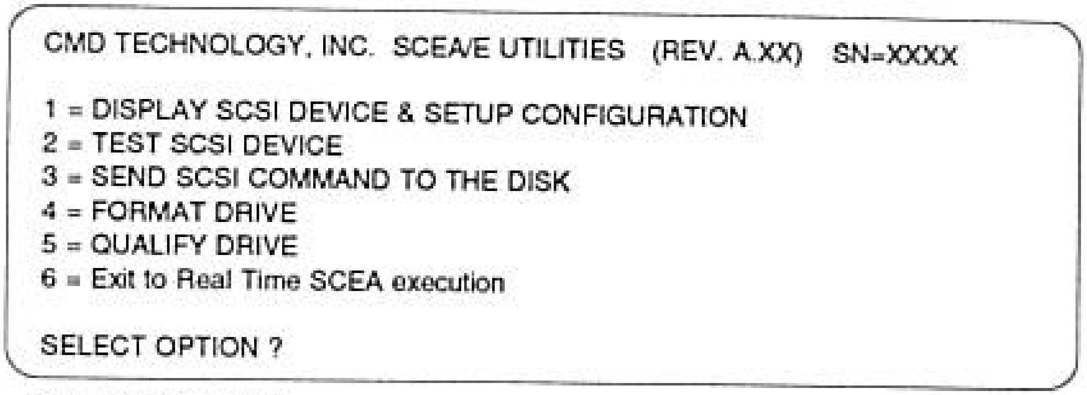


Figure 4-25: RS-232 Cable Pin Out

2 Set the terminal baud rate to 9600 (8-bit data, 1-stop bit, no parity) jump scroll.

3 Hit carriage return on the terminal. The SCEA Utilities will display as shown in Figure 4-26.



```
CMD TECHNOLOGY, INC.  SCEA/E UTILITIES   (REV. A.XX)   SN=XXXX

1 = DISPLAY SCSI DEVICE & SETUP CONFIGURATION
2 = TEST SCSI DEVICE
3 = SEND SCSI COMMAND TO THE DISK
4 = FORMAT DRIVE
5 = QUALIFY DRIVE
6 = Exit to Real Time SCEA execution

SELECT OPTION ?
```

Figure 4-26: SCEA Utility

NOTE Utility will display which model you have (ie., SCEA/E, SCEA/C, SCEA/J1, or SCEA/J2), the revision of firmware installed and your SCEA's serial number.

Once the SCEA Utilities appears, you can key in the number to select the desired option. Press **[CTRL] + C** or **[BREAK]** at any time to return to the SCEA Utilities Menu.

4 Refer to the next sections for configurations. When completed, unplug the terminal, reset the system, and boot. DO NOT use the On-Board Utility while the system is running.

Displaying SCSI Device and Setting Up Configuration

This selection can be used to change the controller default configurations such as those listed below:

- reset to default
- number of disk devices supported
- SCSI reset enable/disable

This utility can also scan/display the SCSI devices attached to the SCEA. The SCEA will be shown as an example in the following display.

To display SCSI devices and set up configuration follow the procedures below.

1 Select option *1* at the SCEA Utilities, the following current configuration is displayed as shown in Figure 4-27.

```
DEV0  SCSI ID 0 [Vendor ID, Product ID, Product Rev. Number]
DEV1  SCSI ID 1 [Vendor ID, Product ID, Product Rev. Number]
DEV2  SCSI ID 2 [Vendor ID, Product ID, Product Rev. Number]
DEV3  SCSI ID 3 [Vendor ID, Product ID, Product Rev. Number]
DEV4  SCSI ID 4 [Vendor ID, Product ID, Product Rev. Number]
DEV5  SCSI ID 5 [Vendor ID, Product ID, Product Rev. Number]
DEV6  SCSI ID 6 [Vendor ID, Product ID, Product Rev. Number]
DEV7  SCSI ID 7 SCEA, SCSI Reset ON
```

Figure 4-27: Current configuration, default

2 To change the configuration, enter **Y** at the statement: CHANGE CONFIGURATION ? (Y/N) The menu shown in Figure 4-28 will display.

```
R = Toggle SCSI Reset
C = Reconfigure Device
Z = Reset Controller to Default Configurtation
```

Figure 4-28: Configuration change

The following list is an explanation of the selections in Figure 4-28.

R = Toggle SCSI reset—Choosing this option will toggle the controller's ability to issue SCSI resets.

C = Reconfigure Device—This option will allow you to reconfigure the number of devices connected to the SCEA.

Z = Reset Controller to Default Configuration—This option allows the you to set the controller to its factory default configuration.

NOTE If you ever reconfigure the board, you must reset the configuration to default using selection Z.

3 To reconfigure the device select option *C* and the screen will prompt you to answer the next series of questions as shown in Figure 4-29.

```
Number of Devices (disk or tapes) ? (0-7)    4
```

Figure 4-29: Reconfigure Device

4 Enter the number of devices. Default configuration is seven devices. This screen will not allow you to enter 0 devices.

5 When you have completed these instructions the display will show your current configuration and prompt you again with the question CHANGE CONFIGURATION ? (Y/N). Enter *N*; this will cause the SCEA to scan the SCSI bus.

The utility will display your current configuration with manufacturer's name, model number, and firmware revisions for each device. Record this information for future use.

Testing SCSI Device

This selection can be used to read only, and write and read selected disk drive. This is a diagnostic tool to help with installation and testing. Follow the procedures below to test the SCSI device.

1 Enter 2 from the SCEA Utilities Menu.

2 At the question DEVICE NUMBER ? DEV <0-6> DEV enter the device number.

3 When testing for *disk devices*, at the statement READY TO TEST DEVICE X, DO YOU WANT TO READ ONLY ? <Y OR N> enter *Y* to read only.

Enter *N* to write and read.

WARNING This will destroy all data on the device.

The question ARE YOU SURE? will display. Enter *Y* to write and read to the device.

The test will continue until you abort. Allow the test to continue for a few minutes for new devices and ten minutes for suspected bad devices.

Bad blocks will automatically be replaced and the following message will display.

```
BAD BLOCK AT LOGICAL BLOCK XXXXXX REPLACED.
```

Press **[BREAK]** or **[CTRL] + C** to abort and exit back to the SCEA Utilities.

Sending SCSI Commands To The Device

This selection can be used to send SCSI commands to the selected disk drives directly and is used to send a 6-, 10-, or 12-byte command to a SCSI device. Follow these procedures to send SCSI commands to the device:

1. Enter *3* from the SCEA Utilities Menu.
2. At the question DEVICE NUMBER ? DEV <0-6> DEV enter the device number.
3. Enter the command sequence at the statement:

   ```
   READY TO TEST DEVICE X
       EDIT CDB <HEX>  ***<ESC> TO TERMINATE EDITING***
       BYTE  0000= 00
   ```

   If a 6- or 10-byte command is used, press **[ESC]** to terminate command editing. If a 12-byte command is used, command editing is terminated automatically.
4. At the statement WRITE DATA TO THE DEVICE ? <Y OR N> enter *N* to immediately send the command if SCSI command does not require a data out phase. Reply will be given that data have been received.

   Or enter *Y* to send data to the device after the command phase if SCSI command requires a data out phase. Enter the data and enter **[ESC]** to terminate editing. The statement SAVE EDITED DATA IN BUFFER ? <Y OR N> will appear. Enter *Y* to save data in the buffer; or enter *N* to erase edited data after the command is sent.

Formatting the Drive

This section details formatting a drive. The SCEA issues Format Unit Command to the selected SCSI disk drive. Remember formatting a drive will rewrite all the sectors of that drive.

CMD recommends that you format all new drives. To format a drive, follow the steps below:

1. Select option *4* from the SCEA Utilities Menu.
2. Enter the device number from 0 to 6 in the statement: DEVICE NUMBER? <0 TO 6> DEV X.
3. Answer *Y* to the question FORMAT DRIVE X, ARE YOU SURE? if you want to continue.
4. At the statement: WARNING DATA WILL BE DESTROYED, ARE YOU SURE? enter *Y* if you want to continue.
5. The monitor displays WAIT while the drive is executing the format process.
6. The monitor will display COMPLETE when finished executing.

Qualifying the Drive

After formatting the device, CMD recommends you qualify devices by running this procedure at lease once without errors detected. The qualify program writes different patterns to the drive and then verifies the data. If there are any bad sectors, the sectors will automatically be replaced and the statement XX XXXXXXXX BAD BLOCK REPLACED will appear. Follow the instructions below for qualifying a drive.

1. Select option *5* from the SCEA Utilities.
2. Enter the device number at the statement: DEVICE NUMBER? DEV <0 TO 6> DEV X.
3. At the statement, READY TO TEST DEVICE X, ARE YOU SURE enter *Y* if you want to continue.
4. At the statement: WARNING DATA WILL BE DESTROYED, ARE YOU SURE? enter *Y* if you want to continue.

5 The monitor will display QUALIFY STARTED <SEQUENTIAL WRITE & READ>! <HIT <Break> TO ABORT>.

6 The monitor will display TESTING LOOP COUNT & BLOCK NUMBER:

7 Press **[BREAK]** to exit back to the SCEA Utilities after you are satisfied with the qualifying process.

Completing Utility Functions

The following procedures should be completed when you have accessed the On-Board Utility through the RS-232 port.

1 Use the On-Board Utility to verify SCSI cable and SCSI devices connected to the SCEA after installing the SCEA.

2 After verifying the SCSI connections, disconnect RS-232 cable from the back panel, and select Option 6 from the On-Board Utility menu. This will reset the system.

NOTE If the terminal is connected, this may cause the On-Board Utility to be invoked during system operation.

Multi-Hosting Configuration for VMS

The following is a list of software requirements for multi-hosting; refer to Appendix A for supported multi-hosting devices:

- VMS version 5.3 or above
- VAX cluster software must be running on both systems with at least one of the DEC's interconnects operational
- Tape drives can only be mounted to one system at a time
- Allocation classes must be the same for all systems when installing disk drives (value must not equal 0).

Using VMS and the SCEA, you can multi-host by following these instructions:

1 Configure the SCEA at J1 to SCSI ID 0 for both computers. If you need to alter the Host SCSI Port ID change the jumper settings as shown in Table 4-2.

Table 4-2 Host SCSI Port (J1) ID Jumper Selections

Host SCSI Port ID Numbers	W12-1	W12-2	W12-3
SCSI ID = 7, highest priority	IN	IN	IN
SCSI ID = 6	IN	IN	OUT
SCSI ID = 5	IN	OUT	IN
SCSI ID = 4	IN	OUT	OUT
SCSI ID = 3	OUT	IN	IN
SCSI ID = 2	OUT	IN	OUT
SCSI ID = 1	OUT	OUT	IN
SCSI ID = 0, lowest priority (F)	OUT	OUT	OUT

Note that (F) means factory setting.

2 Configure the SCEA at J2 to SCSI ID 7 for the first computer; configure the SCEA to SCSI ID 6 for the second computer. If you need to alter the Device SCSI Port ID change the jumper settings as shown in Table 4-3.

Table 4-3 Device SCSI Port (J2) ID Jumper Selections

Device SCSI Port ID Numbers	W13-1	W13-2	W13-3
SCSI ID = 7, highest priority (F)	IN	IN	IN
SCSI ID = 6	IN	IN	OUT
SCSI ID = 5	IN	OUT	IN
SCSI ID = 4	IN	OUT	OUT
SCSI ID = 3	OUT	IN	IN
SCSI ID = 2	OUT	IN	OUT
SCSI ID = 1	OUT	OUT	IN
SCSI ID = 0, lowest priority	OUT	OUT	OUT

Note that (F) means factory setting.

See Figure 4-30 as an example.

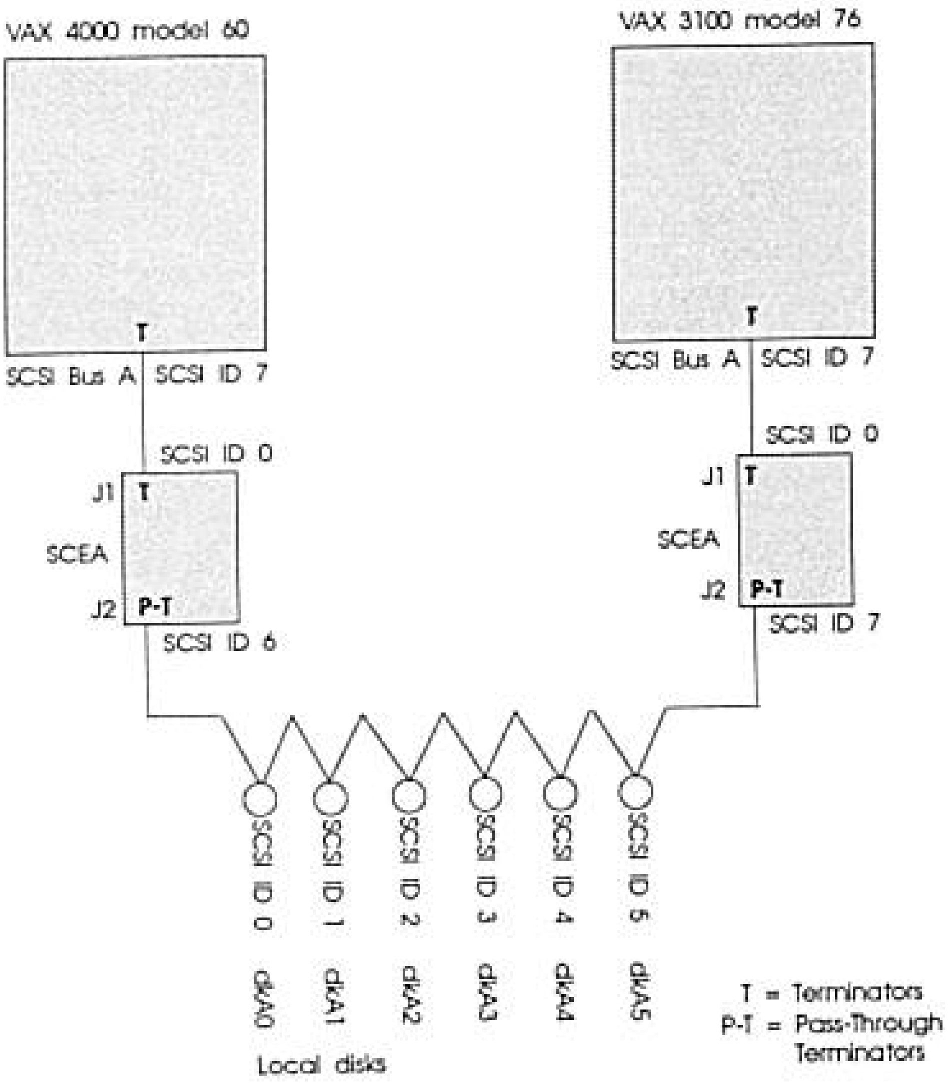


Figure 4-30: Example of Multi-Hosting

3 From the SCEA Utilities Menu in the On-Board Utility, follow these instructions:

- a Select option *1* to display current configuration.
- b Answer *Y* to the statement: CHANGE CONFIGURATION ? (Y/N) The menu shown in Figure 4-28 will display.
- c Select *Z* to reset configuration back to default.
- d Answer *Y* to reconfigure the adapter.
- e Select *R* to toggle SCSI reset. Then set the SCSI reset to OFF. Do this for all SCSI host adapters to be multi-hosted.
- f Answer *Y* to reconfigure the adapter.

g Select *C* to reconfigure the device. Then configure the SCEA for exact number of disks and tapes. This will inhibit scanning of other host adapters (see Figure 4-27).

h If other MSCP disks are in the cluster, make sure each device has a unique unit number.

i Exit out of the On-Board Utility.

NOTE In a multi-hosting system the *physical* disk device name must be identical on both systems.

4 Terminate both *physical* ends of the SCSI bus. See Figure 4-30.

If the SCEA is at either end of the SCSI bus, remove on-board terminators, RN1, RN3, RN4, and use a pass-through terminator as close to the board as possible.

If the SCEA is in the middle of the SCSI bus, RN1, RN3 and RN4 terminators *must* be removed, do not use pass-through terminators.

5 Set the *sysgen* parameter MSCP_SERVE_ALL=0 on all systems.

6 Bring up all systems in the SCEA cluster.

7 See that all connnects have been carried out on all systems. Under some versions of VMS and on some types of VAXes, this may have to be done manually using the VMS Sysgen Connect Statement. Enter the lines in your startup file so you will not have do this everytime you boot the system, for example:

```
$   mcr   sysgen   connect   dka1:/noadapter
$   mcr   sysgen   connect   dka2:/noadapter
$   mcr   sysgen   connect   dka3:/noadapter
```

Or set up a connect disk *com* file for the *systartup_v5.com* file to access upon bootup. See "VMS/VAXstation" for further VMS configuration.

On DEC Alpha AXP systems the connect statement is issued under *sysman*. For example:

```
$   mcr   sysman   io   connect   dka1:/noadapter/drive=sys$dkdriver
$   mcr   sysman   io   connect   dka2:/noadapter/drive=sys$dkdriver
$   mcr   sysman   io   connect   dka3:/noadapter/drive=sys$dkdriver
```

Before serving devices to other nodes in the cluster, make sure that all nodes recognize the devices dual hosted.

8 Now enable all the devices to be served to the cluster manually by entering a *set device/served* statement for each device. For example:

```
$ set device/served dka0:
$ set device/served dka1:
```

9 After all devices are connected and served, they may be mounted cluster wide. For example:

```
systema $ mou dka0:/cluster/system disk0
systema $ mou dka1:/cluster/system disk1
```

In the event that one system becomes inoperable with only two nodes in the VAX cluster, a quorum disk must be used to count as a vote; this keeps the other system running. Refer to VMS VAXcluster manual order number AA-LA27A-TE to set up a quorum disk and a VAX cluster.

NOTE When running *cluster_config.com* on a system with only Ethernet as a computer interconnect, answer **Yes** for the question, "WILL THIS BE A SATELLITE NODE?"

Appendix A

Supported Devices and Operating Systems

This appendix lists all SCSI devices and operating systems supported by the SCEA.

SCSI Devices

The following is a list of all SCSI devices that are supported by the SCEA.

NOTE *Italics* indicates new qualified device; **bold** indicates device supporting multi-hosting; and ***bold italics*** represents new qualified device supporting multi-hosting. Multi-hosting is supported in VMS only.

Magnetic disk drives

SEAGATE	WREN-IV, WREN V, **WREN VI**, SWIFT SABRE, **WREN VII**, ***ELITE***, **WREN VIII**
CONNER	CP-3100, *CP3200*
CITOH	YD-3042, YD3082
DEC	*RZ23, RZ24, RZ56, RZ57*
FUJITSU	M2246SA Series, ***M2263SA***
HITACHI	**DK515C Series**, *DK516C*
HP	97548S/D series
IBM	320 MB, 3½ inch
MAXTOR	XT-4000S Series, XT-8000S Series
MICROPOLIS	***1588-15***
QUANTUM	ProDrive 40S/80S
TEAC	*FD235HS* (3½ inch floppy, DEC RX23 compatible)

More disk drives will be qualified soon.

Erasable Optical disk drives

MAXOPTICS	Tahiti, Tahiti I, Tahiti II
SONY	**SMO-D501, SMO-D503**
RICOH	*RO-5030E, RO-5030E-II*
SHARP	*JY-7000U*
PIONEER	DE-U7001
TEN-X OCU	
MOST	RMD-5100-S
Pinacle	REO-130

Erasable Optical disk cartridge manufacturers

SONY, RICOH, MAXOPTICS, PDO, 3M.

WORM drives

TEN-X OCU
Computer Upgrade Multifunction

Tape drives

1 8-mm helical scan tape drives

EXABYTE	**EXB-8200**, EXB-8500

2 4-mm DAT (Digital Audio Tape)

Archive	**Python 4520 DAT**
HP	**35450A DAT**, 35470A
SONY	**SDT-1000 DAT**

3 9-track reel-to-reel tape drives

Cipher	F880-II, M990, M995
HP	Model 88780B
KENNEDY	Model 9612
M4 data	Model 9914
QUALSTAR	Model 340
TELEX	Model 9294
DEC	TSZ07

64 TK50-compatible tape drives

DEC	TZ30

Jukeboxes (SCEA/J only)

1 Disk Jukebox

Hewlett-Packard	*C1710A*
IDE	*6500*

2	Tape Stacker	
	Exabyte	EXB 120, EXB-10i
	ADIC (4 mm)	2500

Operating Systems Supported

VAXstation 3100 Model 30, 38, 76

VMS version 5.3, 5.4, 5.5

Sun SPARCstation and SPARCserver

SunOS 4.1.1

DECstation 5100

ULTRIX version 4.0 and above.

IBM RISC System/6000

AIX Version 3.

SGI IRIS INDIGO

IRIX Release 4.0.1.

Appendix B

Troubleshooting

This appendix assists you in using the VMS Analyze/Error Utility and troubleshooting minor problems that may occur.

VMS Analyze/Error Utility

The SCEA logs controller dependent information in *errlog.sys* file. You may use the VMS Analyze/Error Utility to open *errlog.sys* and display error messages for troubleshooting. By including option switches such as */since=date* and */include=mub0*, you may define the time reference and device. To enter the Analyze/Error Utility, log onto the system and enter the following command:

```
ana/err/since=[time]/include=[device]
```

Some examples are shown by the following:
To view all errors that VMS has logged, enter:

```
ana/err
```

To view the errors only on disk devices, enter:

```
ana/err/inc=disks
```

To view the errors that have occurred only on one disk unit (*dka0*), enter;

```
ana/err/inc=dka0
```

To view the DKA0 errors that occurred on April 20, 1990 since 14:22 (02:22 PM), enter:

```
anal/err/since=20-Apr-1989:12:22/inc=dka0
```

Cables

If the system does not recognize the SCEA or devices connected, check the following:

- Make sure pin 1 on the cable is aligned with pin 1 on the SCSI device or SCEA. Make sure pins are *NOT* bent.
- Make sure the cable is not longer than 20-feet total for internal and external cables.

LED Indicators

When DS5, the Red LED, is lit, turn system OFF and reboot. If the Red LED is still lit, call CMD technical support at (800) 426-3832 or (714) 454-0800.

When DS4, a Green LED, and DS5, the Red LED, blink one after the other consistently, the EPROM is configured wrong.

CMD Technical Support

Having a CMD board entitles you to responsive technical support. Before you call CMD Technical Support, please gather the information listed below appropriate to your configuration. Make a note of any on-screen messages when a problem occurs and have this manual close by.

CMD	CMD product model number and serial number. Firmware Revision of CMD board as shown on Eprom with a blue CMD logo and copyright label. Listing of jumper settings on the board. CMD Reseller/VAR/Integrator and contact.
SCSI	SCSI device model numbers and firmware Revision as displayed using the SCEA On-Board Utility. Settings of SCSI ID numbers of all devices.

Computer	Computer model. Operating System version. Complete listing of other controllers in computer backplane. Specify multi-hosting or clustering (VMS systems only).
Problem	Describe exact nature of problem. Specify detailed error messages. Specify any recent modification to the system. Is this a new installation? Does the problem occur consistently? Does the problem occur when you do not use the board? Does the problem occur with another system (if available)?

You may contact CMD Technical Support from 8:30 AM to 5:30 PM, Pacific Standard Time, Monday through Friday, excluding major holidays, at:

(714) 454-0800 or
(800) 426-3832 or
(714) 455-1656 FAX

Appendix C

Connectors and Jumper Settings

This appendix lists connectors and jumper settings for the SCEA.

Connectors

Table C-1 list connectors for the SCEA.

Table C-1 **Connectors**

J1	SCSI connector to the host computer
J2	SCSI connector to SCSI devices
J300	power connector: Pin 1 no connection Pin 2 ground Pin 3 ground Pin 4 +5 volts (1.5 Amps)
J4	designed for On-board RS-232 Utility
J5	designed for user front panel interface–not implemented for current firmware

Figure C-1 illustrates the pin locations of the SCEA nonshielded SCSI device connectors (J1 and J2).

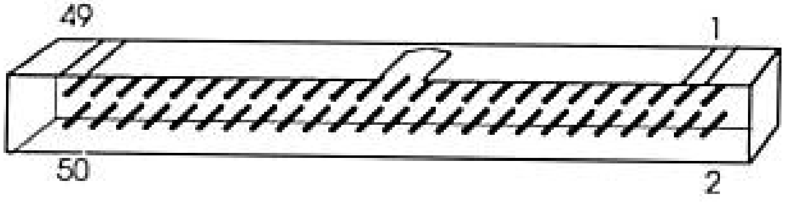


Figure C-1: Nonshielded SCSI device connector

Table C-2 shows the SCEA J1 and J2 connector pin assignments.

NOTE All odd pins except pin 25 are connected to ground. Pin 25 is left open. The minus sign next to the signal indicates active low.

Table C-2 J1 and J2 Connector Pin Assignments

Signal	Pin Number
-DB(0)	2
-DB(1)	4
-DB(2)	6
-DB(3)	8
-DB(4)	10
-DB(5)	12
-DB(6)	14
-DB(7)	16
-DB(P)	18
GROUND	20
GROUND	22
GROUND	24
TERMPWR	26
GROUND	28
GROUND	30
-ATN	32
GROUND	34
-BSY	36
-ACK	38
-RST	40
-MSG	42
-SEL	44
-C/D	46
-REQ	48
-I/O	50

Jumper Settings

Table C-3 lists the jumper settings for the SCEA.

Table C-3 Jumper Settings

Jumper	Setting	Description
W1	IN	Terminator Power for J1 enabled
W1	OUT	Terminator Power for J1 disabled (F)
W2, W3, W4, W5, W6, W7, W8, W10, W12-4, W12-5, W13-4, W13-5, W16, W17	OUT	Reserved (F)
W11-1, W11-2	IN	Reserved (F)
W12-6	IN	Removable Media enabled
W12-6	OUT	Removable Media disabled (F)
W15	All-OUT	Reserved (F)
W19	IN	Terminator Power for J2 enabled (F)
W19	OUT	Terminator Power for J2 disabled
W9, W18, W20, W21, W22	1-2 IN	Reserved (F)

Note that (F) is factory setting.

Table C-4 lists the jumper selections that can be changed the Host SCSI Port (J1).

Table C-4 Host SCSI Port (J1) ID Jumper Selections

SCEA SCSI ID for J1	W12-1	W12-2	W12-3
7	IN	IN	IN
6	IN	IN	OUT
5	IN	OUT	IN
4	IN	OUT	OUT
3	OUT	IN	IN
2	OUT	IN	OUT
1	OUT	OUT	IN
0 (F)	OUT	OUT	OUT

Note that (F) is factory setting.

Table C-5 lists the jumper selections that can be changed for the Device SCSI Port (J2).

Table C-5 Device SCSI Port (J2) ID Jumper Selections

SCEA SCSI ID for J2	W13-1	W13-2	W13-3
7 (F)	IN	IN	IN
6	IN	IN	OUT
5	IN	OUT	IN
4	IN	OUT	OUT
3	OUT	IN	IN
2	OUT	IN	OUT
1	OUT	OUT	IN
0	OUT	OUT	OUT

Note that (F) is factory setting.

Table C-6 lists platform control selections.

Table C-6 Platform Control

Platform	W14-1	W14-2	W14-3	W14-4	W14-5 (close to J5)
DEC VAX (F)	OUT	OUT	OUT	OUT	OUT
IBM	OUT	OUT	OUT	OUT	IN
SUN	OUT	OUT	OUT	IN	OUT
PC	OUT	OUT	IN	OUT	OUT
DEC ULTRIX	OUT	IN	OUT	OUT	OUT
SGI	IN	OUT	OUT	OUT	OUT
UNISYS	OUT	OUT	IN	IN	OUT

Note that (F) is factory setting.

Glossary

The following is a glossary of frequently used SCSI terms.

Connect—The function that occurs when an initiator selects a target to start an operation.

Device—A host computer adapter or a peripheral controller or an intelligent peripheral that can be attatched to the SCSI bus.

Disconnect—The function that occurs when a target release control of the SCSI bus, allowing it to go to the BUS FREE phase.

Initiator—A SCSI device (usually a host system) that requests an operation to be performed by another SCSI device.

LUN—Logic Unit Number.

Peripheral device—A peripheral that can be attatched to an SCSI device (e.g., magnetic disk, magnetic tape, or optical disk).

Reconnect —The function that occurs when a target selects an initiator to continue an operation after a disconnect.

SCSI — Small computer systems interface.

SCSI address—The value of the unique address (0-7) assigned to an SCSI device. This address would normally be assigned and set in the SCSI device during system installation.

SCSI ID—The bit-significant representation of the SCSI address referring to one of the signal lines DB (7-0).

SCSI device—A host computer adapter or a peripheral controller or an intelligent peripheral that can be attatched to the SCSI bus.

Target—A SCSI device that performs an operation requested by an initiator.

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I. Installing the SCEA

The SCEA may be installed inside the chassis of the SCSI device if space constraints allow, inside a storage box, or inside a system.

1 Turn the host computer completely OFF and unplug the power cord from the wall.

2 Carefully unpack the SCEA and place on a non-metallic stable surface.

WARNING Be sure to wear anti-static wrist straps or equivalent to protect the CDU-710 from electro-static damage.

3 Carefully install the SCEA into an assigned slot inside a storage box, shoebox, or system, see Figure 1 as an example.

WARNING Make sure the SCEA or any of its components are NOT directly touching metal surfaces; attach plastic washers on BOTH sides of the mounting screws. Make sure there is proper ventilation in the storage unit.

4 Set Host SCSI Port ID (J1) to *0* by making sure jumper(s) are removed from W12 pins. If another device on the SCSI bus has SCSI ID 0, set the J1 SCSI ID to 1, 2, 3, or another number up to 7 by placing jumpers over the pins as listed in Table 1 (see Chapter 2, section "Host SCSI Port" for explanation of SCSI ID).

Table 1 Host SCSI Port ID (J1) Jumpers

Host SCSI Port ID	W12-1	W12-2	W12-3
SCSI ID = 7 (reserved for Host Computer)	IN	IN	IN
SCSI ID = 6	IN	IN	OUT
SCSI ID = 5	IN	OUT	IN
SCSI ID = 4	IN	OUT	OUT
SCSI ID = 3	OUT	IN	IN
SCSI ID = 2	OUT	IN	OUT
SCSI ID = 1	OUT	OUT	IN
SCSI ID = 0 (F)	OUT	OUT	OUT

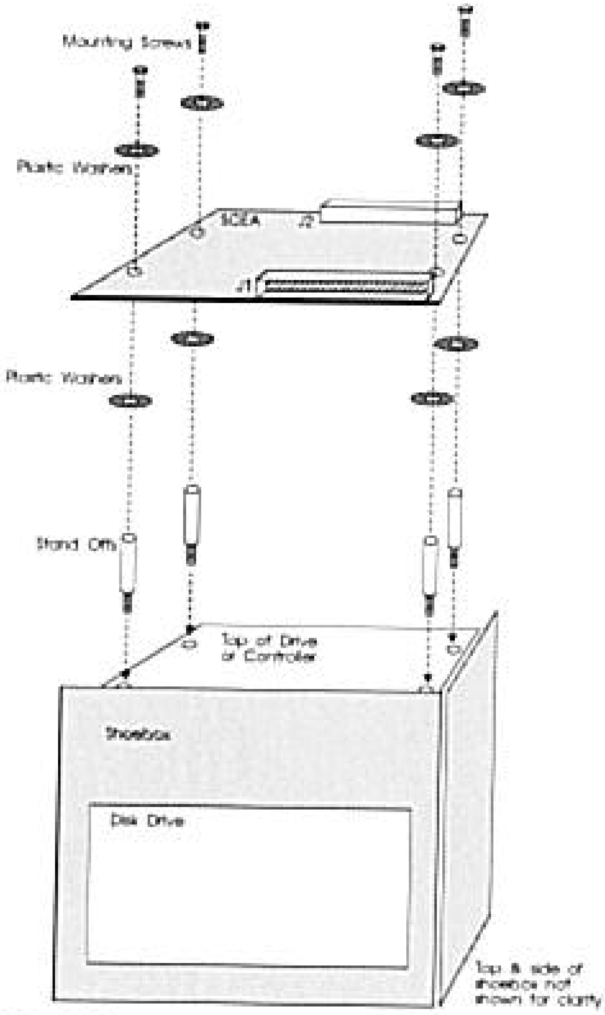

Figure 1: Shoebox installation example

5 Connect one end of the SCSI cable from the SCSI connector of the host computer to the SCEA at J1, Host SCSI port; **pin 1 of the SCSI cable and pin 1 of the SCEA *must* align.** If the SCEA is inside a storage box or shoebox, the cable connection will be similar to that shown in Figure 2.

6 Connect the appropriate 4-pin power cable to the power connector, J300. Be sure pin 1 from the cable is aligned with pin 1 on the SCEA.

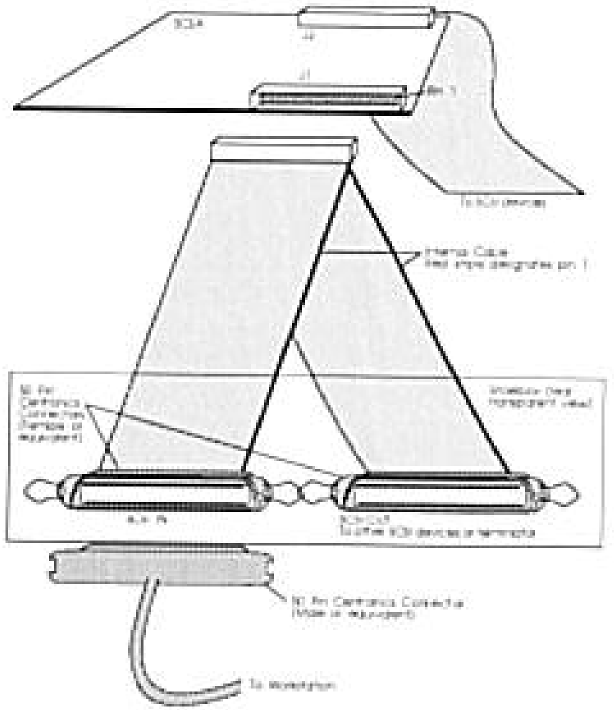
SCEA
J2
J1
Pin 1
To SCSI devices
Internal Cable
Red stripe designates pin 1
50 Pin Centronics Connectors (Female or equivalent)
SCSI IN
SCSI OUT
To other SCSI devices or terminator
50 Pin Centronics Connector (Male or equivalent)
To Workstation

Figure 2: Shoebox J1 SCSI connection

See Figure 3; for connector information, see Appendix D, SCEA User's Manual.

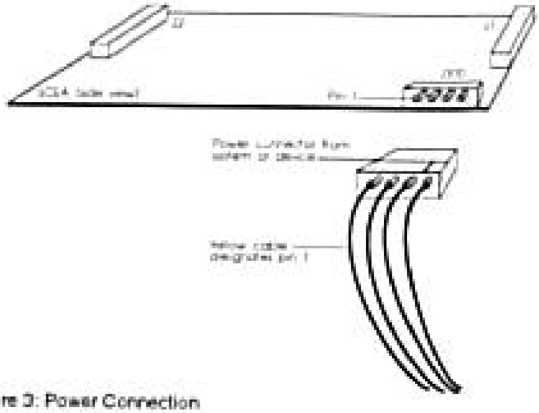
J2
J1
J300
SCEA (side view)
Pin 1
Power Connector from system or device
Yellow cable designates pin 1

Figure 3: Power Connection

7 Terminate each *physical* end of the SCSI bus connected to J1. If SCEA is at one end of the SCSI bus, *install terminators RN1, RN3 and RN4 at J1* (numbers must face J1) otherwise remove them. See Figure 4.

8 Remove jumper shunt in W1 to disable TERMPWR at J1. Put jumper shunt in W1 to supply TERMPWR (if host computer is not supplying terminator power); see Figure 4.

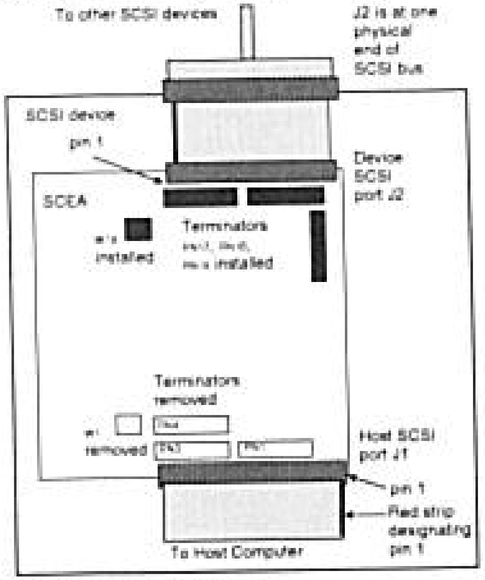

Figure 4: SCSI Port termination

II. Installing SCSI Devices

Follow instructions listed below for proper SCSI device installation.

1 Make sure jumpers are on W13-1, W13-2, and W13-3 to identify the Device SCSI port (J2) as ID 7. If another device on the SCSI bus has SCSI ID 7, set the J2 SCSI ID to 6, 5, 4, or another number down to 0 by placing jumpers over the pins as listed in Table 2 (see Chapter 2, section "Device SCSI Port" for complete explanation of SCSI ID).

Table 2 Device SCSI Port ID (J2) Jumpers

Device SCSI Port ID	W13-1	W13-2	W13-3
SCSI ID - 7 (factory)	IN	IN	IN
SCSI ID - 6	IN	IN	OUT
SCSI ID - 5	IN	OUT	IN
SCSI ID - 4	IN	OUT	OUT
SCSI ID - 3	OUT	IN	IN
SCSI ID - 2	OUT	IN	OUT
SCSI ID - 1	OUT	OUT	IN
SCSI ID - 0	OUT	OUT	OUT

2 Connect one end of a SCSI cable to the SCEA at J2, Device SCSI port; **pin 1 of the cable and pin 1 of J2 *must* align to prevent damage to the system.** See Figure 5.

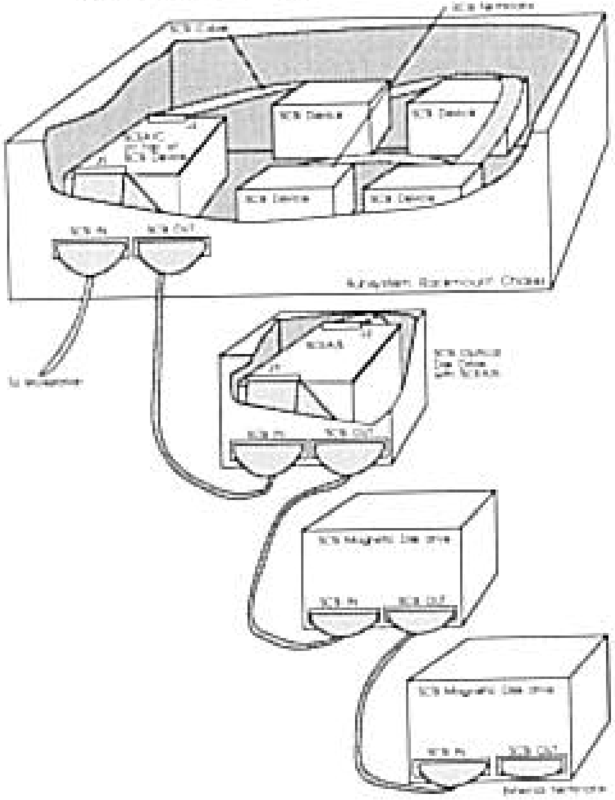

Figure 5: Cabling example from inside Subsystem

3 Connect the other end of the cable to the SCSI device (align pin 1's). Up to seven devices may be installed by correctly cabling to other SCSI devices. Figure 5 shows the SCEA/C inside the subsystem rackmount chassis with devices connected and SCEA/E inside the optical drive.

4 Terminate each *physical* end of the SCSI bus connected at J2. *DO NOT* terminate devices in the middle of the SCSI bus; if the SCEA is in the middle of the SCSI bus; *remove terminators RN17, RN18, and RN19* otherwise install terminators (numbers must face J1).

SCSI devices can be terminated directly on the device (see manufacturer's documentation) or by using an external terminator as shown in Figure 4.

5 For terminator power put jumper shunt in W19 (this allows for +5-volts to be sent to the external terminator at the end of the SCSI bus). Remove W19 if you do not want the SCEA to supply TERMPWR. See Figure 4.

III. On-Board Utility

The On-Board Utility is very useful for troubleshooting SCSI devices and the SCSI bus. To access it, follow these instructions.

1 Connect a terminal to the SCEA's RS-232 port (10-pin connector).

2 Set the terminal baud rate to 9600 (8-bit data, 1-stop bit, no parity) jump scroll.

3 Hit carriage return on the terminal and the SCEA Utilities will display. See Chapter 4 for details on using the On-Board Utility.

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